Montana Department of
ENVIRONMENTAL QUALITY
Judy Martz, Governor
P.O. Box 200901 • Helena, MT 59620-0901 • (406) 444-2544 • www.deq.state.mt.us

September 7, 2004

Dear Reader:

Enclosed you will find a Environmental Assessment of a proposal from NorthWestern Energy to upgrade an existing transmission line, which will include reconstructing an existing 50 kV and adding a new 161 kV line to the reconstructed line. The line is approximately 30 miles long, and will connect the existing Three Rivers Substation, three miles northeast of Three Forks, to the existing Jackrabbit Substation near Four Corners, west of Bozeman. The purpose of the project is to provide reliable electrical service to the Bozeman and Belgrade area and to serve growing loads in these areas. NorthWestern proposes to use the existing 50 kV transmission line corridor, with the possibility of a few local changes; most notably the new alignment would not be located along Thorpe Road. The environmental assessment contains additional details of the proposal.

NorthWestern proposes to install new equipment and expand the Three Rivers and Jackrabbit Substations. Additionally, the company proposes to build a new substation between I-90 and West Hulbert Road that will be used to serve customers in this high growth area.

The new line will consist of a combination of single-pole, wooden structures placed approximately 300 feet apart. These structures would be substantially taller than the existing structures. In some areas two-pole wooden "H-frame" structures may be used to allow longer spacing between structures.

The Department is providing a 15-day period in which to submit comments on the EA. The comment period will close **September 22, 2004**. Comments may be mailed to:

Tom Ellerhoff
Montana Department of Environmental Quality
PO Box 200901
Helena, MT 59620-0901

Comments may also be e-mailed to: tellerhoff@state.mt.us or faxed to: (406) 444- 4386. Attention Tom Ellerhoff.

This Environmental Assessment was prepared pursuant to the Montana Environmental Policy Act. This notice and a copy of the EA were filed with the Environmental Quality Council on September 7, 2004.

Tom Ellerhoff

Tom Ellerhoff, Environmental Program Manager
Montana Department of Environmental Quality

Montana Department of
ENVIRONMENTAL QUALITY

September 2004

Environmental Assessment of
NorthWestern Energy's Proposed

Three Rivers to Jackrabbit
161kV Transmission Line Project

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PURPOSE AND BENEFITS OF THE PROPOSED ACTION

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PURPOSE AND BENEFITS OF THE PROPOSED ACTION

1.1 INTRODUCTION

Northwestern Energy (NWE), a division of NorthWestern Corporation (NOR), is proposing to construct a 161kV transmission line between the Three Rivers Substation north of Three Forks, Montana to the Jackrabbit Auto Substation west of Bozeman, Montana and south of Belgrade, Montana (See Figure 1-1). The Three Rivers to Jackrabbit 161kV Transmission Line Project (proposed Project) is approximately 28.5 miles in length with 27.2 miles on private lands and 1.3 miles on Montana State Trust Lands managed by the Department of Natural Resources and Conservation (DNRC). To allow construction and operation on Montana State Trust Lands, NWE has made an application for a land use license granting an easement for the Project.

NWE currently owns and operates 161kV and 50kV transmission lines in the area, as well as serving distribution load to industrial, commercial, and residential uses. The Proposed Action includes the following changes to NWE's existing transmission system (refer to Figure 1-1 for the proposed Project location):

- Construct a 28.5-mile, 161kV transmission line connecting the two upgraded substations
- Relocate existing 50kV transmission lines onto the proposed 161kV structures for all but approximately three miles of the 28.5-mile route
- Use the existing 50kV transmission line rights-of-way (ROW) to the extent possible
- Install new equipment and expand the existing electric substations at Three Rivers near Three Forks and the Jackrabbit Auto Substation west of Bozeman
- Identify a new 161kV substation site southwest of Belgrade along the proposed transmission line to facilitate distribution of electricity

The proposed 161kV transmission line would be located for 26 of its 28.5 miles along existing NWE transmission lines from the Three Rivers Substation to the Jackrabbit Auto Substation (Figure 1-1). The transmission structures would be located within a 40 foot ROW and typically spaced approximately 300 feet apart for single pole construction and approximately 600 feet apart for H-frame construction. Structures would be wooden or steel as defined by engineering analysis. Single poles and H-frame structures would be 60-90 feet in height depending on terrain and structure type.

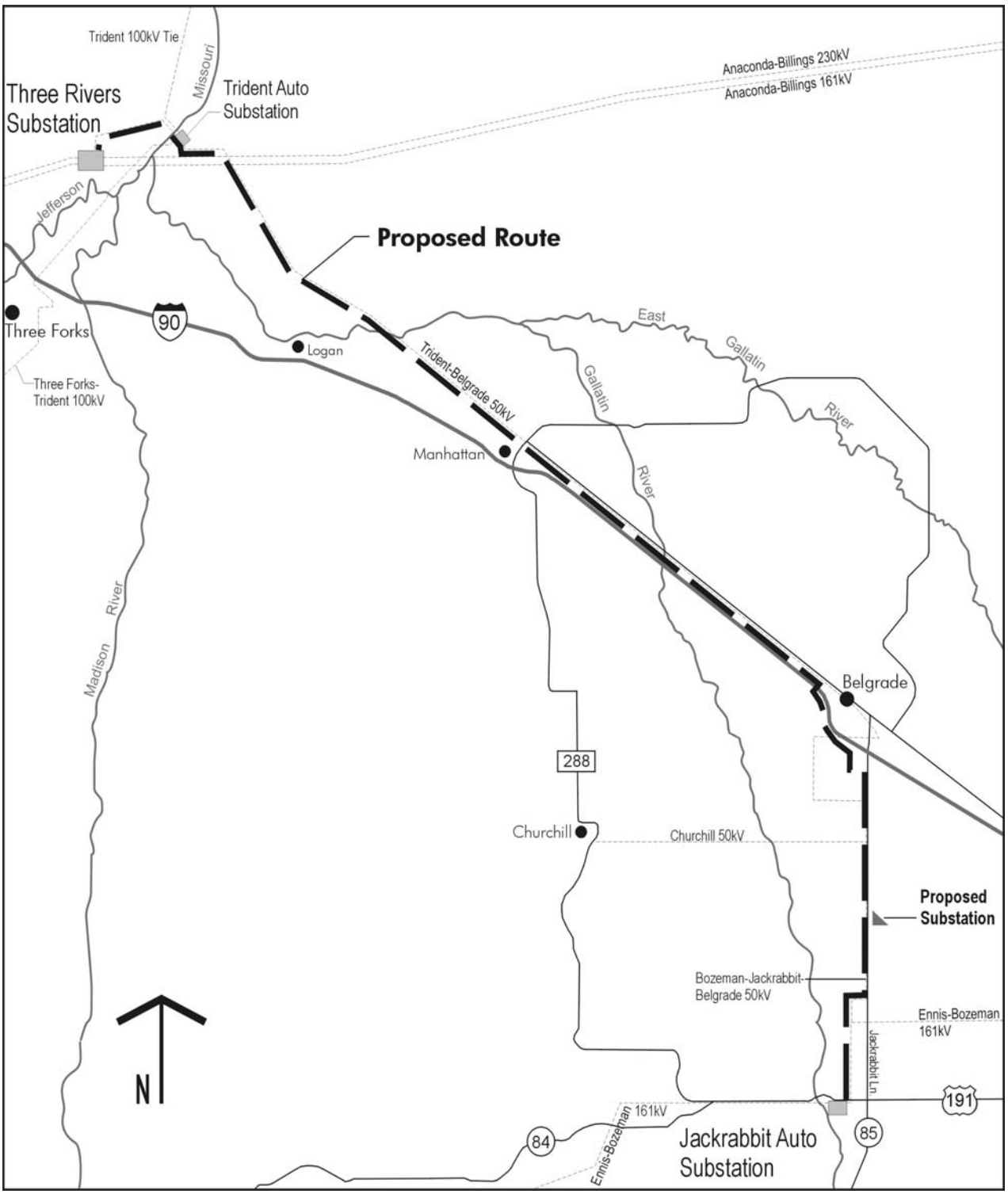
Because of the age and deteriorating condition of the existing 50kV transmission line between Trident and Belgrade, NWE plans to reconstruct this transmission line regardless of the need for the new 161kV transmission line. Since the impacts from the 50kV rebuild will occur in the near future, combining the two projects would minimize cumulative effects of building the projects separately. Placing both circuits on one double circuit 161/50kV pole and doing the construction at one time would reduce the "spreading" of impacts over a larger geographic area for two separate and parallel lines. Combining both lines onto a single structure design for 23 miles would reduce impacts to businesses, resources and landowners.

Substation upgrades at Three Rivers and Jackrabbit substations would include new equipment installation to incorporate the addition of a new 161kV circuit into the substations.

The future 161kV substation, approximately three miles south of Belgrade in Township 1S, Range 4E, Section 25, would be built on an eight-acre parcel of private land. When constructed in approximately 2006, the substation would provide for distribution of electricity from the 161kV transmission line to the growing number of commercial and residential customers in the Belgrade area.

The transmission line upgrade and substation work would cost an estimated $12.5 million over three years. NWE began obtaining permits, ROW approvals and land acquisition in winter 2003. This effort would continue through summer 2004. Construction is anticipated to begin in September 2004 with the system coming on line in fall 2005.

Figure 1-1 Proposed Project Area



This environmental assessment (EA) is prepared pursuant to the Montana Environmental Policy Act (MEPA) by the Montana Department of Environmental Quality (DEQ). The Governor's Interagency Energy Development Task Force selected DEQ to be lead agency for preparation of the EA. Other cooperating agencies include the DNRC, and the Montana Department of Transportation (MDT).

This analysis considers direct, indirect and cumulative effects of the proposed transmission line and alternatives to the Proposed Action. The agencies will use the results of this EA to disclose potential impacts that may result from the construction, operation, and decommissioning of the Project and to support a determination of whether or not the proposed Project has the potential to result in significant adverse impact. If potentially significant impacts would result from the construction, operation, or maintenance of the Project, the agencies must prepare an Environmental Impact Statement (EIS).

1.2 PURPOSE AND BENEFITS

1.2.1 Accommodation of Load Growth

NWE owns, operates and maintains approximately 7,000 miles of electric transmission lines. NWE's most rapid growth rate is occurring in the Gallatin Valley (i.e., Bozeman, Belgrade and surrounding area). The demand for new electrical hookups and expanded service has exceeded NWE's current transmission capacity to reliably serve its customers in this area. NWE has determined that the Proposed Action is needed to continue reliable transmission capacity in the Gallatin Valley and accommodate the population growth and the increasing demand for power.

The demand for energy has increased in southwestern Montana with a steady population growth over the last decade. Gallatin and Broadwater counties in southwestern Montana ranked 2nd and 3rd in growth for Montana from 1990 to 2000, with a growth rate of 34 and 32 percent, respectively (US Census, 2003). Gallatin County's largest community, Bozeman, had a year 2002 population of 29,459. Population projections call for a near doubling of population for Gallatin and Broadwater counties over the period from 2000-2025.

The load in the Bozeman area has grown to a level that insufficient transmission capacity is available to serve customers electrical needs at all times throughout the year. Various transmission lines serve the Bozeman area. With all the transmission lines in-service, these lines can adequately serve the Bozeman area load until the load reaches approximately 180 MW. Equipment overload and low voltage problems arise at various locations when the load exceeds 180 MW. There is no longer adequate transmission to serve the Bozeman area during peak load conditions when all lines are in service because the winter 2002-3 peak load was 185 MW.

Building the 161kV transmission line from Three Rivers to Jackrabbit eliminates this adequacy problem by providing a new source into the Bozeman area.

The proposed new 161kV substation south of Belgrade would be required by approximately 2006 to increase power distribution for growth in the Gallatin Valley. The 161kV transmission line would enter the substation and be stepped down for connection to distribution lines that service residential and commercial uses south of Belgrade and west of Bozeman.

1.2.2 Increase Transmission System Reliability

The Bozeman area is one of the fastest growing areas in Montana. The load in the area has grown to such a level that the reliability of the existing transmission system has become an issue. By definition, the reliability of a transmission system is described in terms of its adequacy and its security. A transmission system is adequate if the transmission system has sufficient capacity to serve customers needs under all conditions throughout the year. Security is the ability to maintain appropriate customer service (voltage level) after an outage of one or more transmission lines. The adequacy of the existing transmission system to serve the growing Bozeman area load was described in Section 1.2.1.

Security problems arise in the Bozeman area when one or more transmission lines serving the area are forced out of service. The worst single transmission line outage is the loss of the Wilsall-Clyde Park 161kV transmission line. Historical records show that this line was forced out of service six times in the five years between 1998-2002. If the load in the Bozeman area is greater than 133 MW when this outage occurs, low voltage at various locations can occur. The load in the Bozeman area is greater than 133 MW approximately 12% of the time throughout the year. The worst double-line outage is the loss of both 161kV transmission lines between Clyde Park and East Gallatin substations. The simultaneous loss of both of these lines has occurred three times in the last 15 years. With the loss of these two lines, the Bozeman area cannot be reliably served if the load is greater than 60 MW. The Bozeman load is greater than 60 MW 99% of the time.

Building the 161kV transmission line from Three Rivers to Jackrabbit improves the transmission system reliability. The new 161kV transmission line provides a new source of power into the area and as a result eliminates the adequacy problem and security problems described above.

1.3 AUTHORIZATIONS, PERMITS, REVIEWS AND APPROVALS

The EA was prepared in response to state permit applications as described in Table 1-1 to meet the requirements of the MEPA. The DEQ as lead agency would consider whether to grant several environmental permits that would enable NWE to implement the proposed Project. DEQ and other agencies will use this EA to make decisions on issuing the following authorizations and permits.

Table 1-1 Federal, State, Local Permits, Approvals and Authorizing Actions

Issuing Agency	Permit/ Approval Name	Nature of Permit	Authority
Federal Government			
U.S. Army Corps of Engineers	Section 404 Permit (Clean Water Act) Nationwide Permit/Individual Permit	Controls discharge of dredged or fill materials in wetlands and other waters of the U.S.	Section 404 of the Clean Water Act (33 CFR 323.1,330)

Issuing Agency	Permit/ Approval Name	Nature of Permit	Authority
U.S. Army Corps of Engineers	Section 10 Permit - Rivers and Harbors Act	Aerial Crossing of Navigable Water	Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)
Federal Aviation Administration (FAA)	Notice of Proposed Construction or Alteration	Tower location and height relative to air traffic corridors	49 USC 1501 13 CFR 77 Objects Affecting Navigable Airspace
State Government			
Montana Department of Environmental Quality (DEQ)	Section 401 Water Quality Certification	Provides a review of potential adverse water quality impacts potentially associated with discharges of dredged or fill materials in wetlands and other waters of the U.S.	Section 401 of the Clean Water Act
	General Discharge Permit for Stormwater Associated with Construction Activity	Permits construction and industrial activities for the Project that would result in the discharge of stormwater to Waters of the state	Montana Water Quality Act (75-5-401 et seq., MCA) Montana Water Quality Act (75-5-101 MCA)
	318 Authorization short-term turbidity	Authorizes short-term exemptions from certain surface water quality standards	
Montana Department of Natural Resources and Conservation (DNRC)	Land Use License (DS-432)	Licensing structures and improvements on state lands and across navigable water bodies	
Montana Department of Transportation (MDT)	Utility Crossing Permit	Grant utility crossing permits for transmission line and access roads that may encroach on state maintained routes	RW131 and/or RW20
State Historic Preservation Office (SHPO)	Section 106 of the National Historic Preservation Act	Consults with project applicants and state agencies regarding impacts on cultural resources that are either listed or eligible for listing on the NRHP.	Montana Antiquities Act (22-3-421 through 442, MCA)

Issuing Agency	Permit/ Approval Name	Nature of Permit	Authority
Local Government			
County Conservation Districts	310 Permit Montana Joint Application	Permits construction activities in or near referenced streams on NFS and private lands. See Montana Department of Environmental Quality Montana Joint Application	Montana Natural Streambed and Land Preservation Act (75-7-101 et seq., MCA)
County Weed Control Districts	Noxious weed management program	Provides containment, suppression and eradication of noxious weeds	Title 7 (7-22-2101-2153, MCA)
County Floodplain Administrators	Floodplain Development Permit Montana Joint Application	Allows construction activities within a designated 100-year floodplain. See Montana Department of Environmental Quality Montana Joint Application	Montana Flood Plain and Floodway Management Act (76-5-401 through 406, MCA)
Boards of County Commissioners	Easement grants and road-crossing permits	Consider issuance of ROW easement grants and road-crossing permits for county property and roadways	Gallatin and Broadwater Counties
Gallatin County Broadwater County	Development Permit	Permit for all land development and building activity in the county	76-2-301, MCA, et. seq. 76-3-501, MCA, et seq. 67-6-20, MCA, et seq. 76-1-606, MCA

1.4 MONTANA TRANSMISSION LINE REGULATIONS

The EA process for this Project began in early 2003 with NWE's discussions with state and federal resource management agencies. The Project would require several permits from Federal, State, and local agencies. Montana law requires that transmission lines of this size and distance be certified under the Major Facility Siting Act, unless statutory exclusion is obtained by NWE acquiring easements or options for easements from 75% of the landowners who collectively own 75% of the ROW. The process of gaining approvals from landowners is underway by NWE. At this time NWE has obtained agreements from more than 75% of the landowners but these agreements do not yet encompass 75% percent of the land crossed by the line (Walsh 2004). DEQ cannot issue permits it administers until NWE demonstrates to DEQ's satisfaction that NWE has obtained the requisite easements. In addition, an EA is required under the MEPA prior to decisions on permits issued by state agencies. Further, this EA has been planned and coordinated so that it could be adopted by federal agencies prior to decisions regarding permits from federal agencies, if needed.

1.5 SCOPING

One of the prime objectives under MEPA is to involve the public in the decision-making process. This section summarizes the issues, comments, and concerns expressed by interested citizens and local agencies to the Proposed Action.

A scoping letter and Project map was sent in April 2003 to agencies and other interested parties requesting comments on the proposed Project. The scoping letter, map, and entities receiving the letter are included in Appendix A.

Additional agency scoping included several meetings between NWE and the United States Fish and Wildlife Service (FWS) and between NWE and the Department of Commerce, State Historic Preservation Office (SHPO), DEQ, DOT, and the DNRC. In addition, meetings were held with local government agencies to solicit information regarding the Project and to collect pertinent data.

Public comments were gathered at an October 23, 2003 public meeting held in Belgrade. The DEQ received additional comments after the public meeting via fax and mail. Table 1-2 summarizes the scoping comments into several major topics including Project Characteristics and Routing, Impacts to the Natural Environment, and Impacts to the Human Environment.

Table 1-2 Scoping Comments

Scoping Comment	EA Section in which Comment is Addressed
Project Characteristics and Routing	
The need for the project.	1.2.1 & 1.2.2
Additional circuit on existing poles.	2.3.2
Spacing between existing and proposed poles.	2.3.2
Use existing 50kV alignment along Amsterdam Road.	2.2.1
Move transmission line along railroad in Manhattan.	2.3.2
Change location of poles on west side of Manhattan.	2.2.1 & Map 5
ROW width description.	2.3.2
Work areas outside permanent ROW.	2.3.2
Avoid commercial and developed corridors.	2.2.1 & 4.3.1
Proposed Route location.	2.3.2
Proposed substation location.	2.3.2
Route line from west of Four Corners area.	2.2.1
Underground construction.	2.2.2
Reliability of underground vs. overhead construction.	2.2.2
Adequacy of payments for construction damages and easements.	2.3.2
Close gates during construction.	2.3.2
Impacts to Natural Environment	
Effects to wetlands and wildlife from Proposed Route in Belgrade area and to area west of Four Corners if line was routed there.	4.2.1 & 4.2.3

Scoping Comment	EA Section in which Comment is Addressed
Impacts to environment in developed vs. undeveloped areas.	4.3.1
Weed control.	4.2.2
Impacts to Human Environment	
Visual impacts.	4.2.7
Residential areas near route.	4.3.1
EMF effects.	4.3.5
Line noise.	4.2.8
Public impact.	4.3.1
Motor vehicle accidents.	4.3.2
Property values: change and determination.	4.3.1
Damage to personal property.	4.3.1
Eminent domain.	2.3.2
States role in determining Project location.	1.3 & 1.4
Reduction of lease fees on state land.	2.2.1 & 4.3.1
Restriction of land uses within ROW.	2.3.2
Description of future development along Jackrabbit Lane.	3.3.1
Effects to homes, businesses, and agriculture from Proposed Route in Belgrade area and to area west of Four Corners if transmission line was routed there.	4.3.1
Cost-benefit analysis of routing through developed vs. undeveloped.	2.2.1
Environmental justice.	4.3.4
Radio and television interference.	4.3.5

CHAPTER 2

ALTERNATIVES INCLUDING THE PROPOSED ACTION

CHAPTER 2
ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

In order to fulfill the stated Purpose and Benefits of the Project of accommodating load growth and increasing transmission system reliability, this EA evaluates the proposed Project as well as other reasonable alternatives to the proposed Project. Those alternatives and the Proposed Action are described within this chapter.

2.2 ALTERNATIVES NOT CARRIED FORWARD FOR DETAILED CONSIDERATION

2.2.1 Transmission Alternatives

Several alternative routes were identified as possible alternatives for siting a 161kV transmission line between the Three Rivers and Jackrabbit Substations. The alternatives were identified through a transmission line siting study conducted during the summer of 2003. The study analyzed the following alternatives and the Proposed Action and compared the potential impacts of each alternative. Reasoning for eliminating alternatives, as described below, are directly derived from the siting study. The result of the siting study was the selection of the Proposed Action as the Proposed Route for the Project.

Transmission Line Routes

The following three alternative routes would be sited primarily outside the existing transmission lines ROWs between the two substations. The primary reason for eliminating these alternatives from further consideration is that they would not take full advantage of reducing potential environmental impacts by combining the proposed Project with the rebuild of the existing Trident-Belgrade 50kV transmission line. Reconstructing this 50kV transmission line into a double circuit line for most of its length would reduce potential ground disturbance and environmental impacts dramatically. Although no specific analyses were developed to compare the costs and benefits of various routes, it is clear that the cost-benefit of utilizing existing ROW and existing alignment, and avoiding to the extent possible the developed and developing areas will reduce the cost and increase the benefit of the Project.

Each of the following alternatives would result in unnecessary cumulative impacts within the Gallatin Valley if the proposed 161kV transmission line were sited outside of the existing and new NWE transmission line ROWs.

The alternatives not carried forward for detailed consideration within this EA are described below. Other potential impacts than those described in the preceding paragraphs are also discussed.

One alternative would route the transmission line west out of Jackrabbit Auto Substation, generally following the alignment of an existing 161kV transmission line and Highway 84 toward the Missouri River. From this point, (within a few miles of the Missouri River), the route would head north to the Three Rivers Substation. However, it was determined by NWE that there are no reasonable routing alternatives to the west of the Jackrabbit Auto Substation. The primary constraints in this area are the conflict with and crossings involved with the many braided stream segments and riparian habitats of the Madison River in this area. Rugged terrain along the river bluffs and few existing roads and linear features limit routing opportunities. Many residences are also located along the existing Ennis-Bozeman 161kV transmission line, so a direct parallel of that ROW would not be possible. Finally, by adding a second 161kV circuit, some trees, residences or associated outbuildings would potentially need to be removed.

Beyond the river crossing, linear features such as roads and existing distribution lines are not aligned in a manner that would provide efficient routing opportunities for the Project. A route through this area would result in the crossing of many miles of agriculture land categorized as Farmland of Statewide Importance, including mechanically irrigated land and would be near several dairy farms and homes. Additionally, a route west of the Jackrabbit Auto Substation would not provide NWE the opportunity for siting a new 161kV distribution substation within the rapidly growing community along Jackrabbit Lane, between the Belgrade and Jackrabbit substations. For these reasons, this alternative route was eliminated from further consideration.

Two other alternatives that were considered by NWE would route the line north from Jackrabbit Auto Substation along Jackrabbit Lane. One of these alternatives would be routed down Cameron Bridge Road west of Jackrabbit Lane through the community of Churchill, before heading north to the existing Trident-Belgrade 50kV transmission line ROW within Manhattan. In addition to the cumulative impacts described above, potential impacts would also include the removal of substantial high quality riparian vegetation along the Gallatin River. This crossing of the Gallatin River would result in higher impacts along Cameron Bridge Road when compared to the proposed crossing of the Gallatin River along the Proposed Route. This is due to a wider river and riparian corridor, higher quality riparian vegetation, and less fragmentation along Cameron Bridge Road. This alternative route was eliminated from further consideration based on these potentially higher impacts.

The second alternative route considered would continue north, parallel to Jackrabbit Lane, within the existing Belgrade-Jackrabbit 50kV transmission line ROW. The route would not be located within Belgrade, but would be sited to the west and then continue north of Belgrade into the hills near Menard, where it would meet and parallel the existing 230/161kV transmission line ROW to the Three Rivers Substation. In addition to the cumulative impacts described above as the primary reason for eliminating this alternative, potential impacts would also include the new transmission line and access roads crossing of known special status plant populations (Utes ladies' tresses and Jones' primrose) near the East Gallatin River. As opposed to utilizing the existing corridor and rebuilding an existing line as proposed by the Proposed Action, this alternative would create a new utility corridor between Belgrade and the Menard area, introducing a new high voltage transmission line corridor and causing new impacts that do not currently exist. The proposed Project would impact the rural residential areas north of Belgrade, when opportunity exists within an existing utility corridor (Proposed Action). For these reasons, this alternative was eliminated from further consideration.

Other possible "localized alternatives" were considered along the Proposed Route. One localized alternative would be a reroute to the south of Manhattan, as well as adjustments to the west of Manhattan. The reroute around Manhattan would have sited the line south of downtown Manhattan and roughly parallel to Interstate 90 (I-90). This alternative was dropped from further consideration due to a lack of area available for a transmission line ROW. The rapidly developing area south of Manhattan includes a trailer park and a subdivision currently under development. By placing the 161kV transmission line within a new ROW outside of the existing railroad corridor, it would create a new utility corridor around the town and would not take advantage of the existing railroad/electric corridor within the town. For these reasons, this localized alternative route was eliminated from further consideration.

Another localized alternative would be a route parallel to Thorpe Road, southwest of Belgrade. This alternative route was eliminated from further consideration because it would not eliminate public issues and potential land use and visual conflicts with proposed new developments on the west side of Belgrade.

A third localized alternative was originally proposed to parallel the existing 50kV transmission line along Frank, Thorpe, and Amsterdam Roads. Because of planned developments in this area, associated visual impacts and opposition by the public, this localized alternative was eliminated from further consideration. Because the 50kV transmission line in this area will be rebuilt along the Proposed Action route, this alignment is proposed to be abandoned.

Adjustments on the west side of Manhattan outside of the existing utility corridor were also removed from consideration due to cumulative effects of separating the proposed Project from the rebuild of the Trident-Belgrade 50kV transmission line, and the introduction of a transmission line and associated facilities (access roads) into an area not previously disturbed. The existing 50kV transmission line is located within a major utility/railroad corridor with substantial disturbance.

Double Circuit the Bozeman-Ennis 161kV transmission line

Opportunities to rebuild other existing transmission lines were evaluated and eliminated from further consideration. For an alternative route west of the Jackrabbit Auto Substation, the potential to rebuild the existing transmission line to a double circuit was examined. Adjacent to the Ennis – Bozeman 161kV transmission line, the two circuits could potentially be placed on double circuits structures, however additional ROW would be required to do this which could result in the removal of buildings/structures.

2.2.2 Alternative Technologies

Underground Construction

Underground transmission systems in the United States have been built since the late 1920s. Usually, underground construction is used for lower voltage distribution lines in urban areas. High-voltage (115kV or above), short-distance, underground installations have been constructed where overhead lines were not feasible (e.g., in the vicinity of airports, urban centers).

High voltage underground transmission lines have markedly different technological requirements than lower voltage underground distribution lines. The majority of the cable would be installed using open-cut trenching techniques. The basic cost of undergrounding a high voltage transmission line can be up to ten to fifteen times more expensive than the cost of overhead construction (NWE 2004). The relatively high cost and installation requirements prohibit the application of underground transmission systems for long distance electric transmission. Undergrounding high voltage transmission lines would typically only be done where required by law or where overhead construction would pose a threat or impedance to existing uses within an area.

While underground transmission lines are relatively immune to weather conditions, they are vulnerable to cable/splice failure, washouts, seismic events, and incidental excavation. Outages for underground lines generally last days or weeks while the problem is located, excavated, and repaired. Typically, failures in overhead lines can be located and repaired in a matter of hours. Long-term outages would be unacceptable, as they would potentially lead to blackouts to customers for long periods while the outage is repaired.

During construction, the environmental impacts of an underground transmission line would be similar to those for major pipeline construction. Greater adverse environmental impacts could be expected because the entire ROW would be disturbed. Particularly, underground construction crossing through wetland and riparian areas and crossing rivers would cause much more significant environmental impacts than an overhead transmission line.

Within a more urbanized setting, the entire ROW would be disturbed, where as an overhead transmission ROW would only involve disturbance at each tower location or other work areas. Typically, no land uses, trees, or structures would be allowed within an underground ROW. Although limited, overhead transmission ROWs would typically allow trimmed trees and potentially some types of structures not directly under the line.

In undeveloped areas, the ROW would be cleared of all trees, brush, and ground cover in order to establish the alignment and to permit construction for an underground line. Overhead transmission line construction typically would result only in disturbances at individual tower sites and at the ancillary facilities associated with access to the ROW.

Magnetic field strength from electric transmission lines is related to the distance from line. While an underground line may reduce the strength of the field at a more rapid rate than an overhead line with distance from the line, the field directly above the underground line can be very high due to its proximity to the ground level.

An underground transmission line would be technically feasible and have few above ground structures and, therefore, less visual contrast than above ground transmission lines. However, because of the technical complications, economic and environmental costs and accessibility, an underground system was not considered a viable alternative and was eliminated from further consideration.

2.3 ALTERNATIVES EVALUATED IN DETAIL

2.3.1 No-Action Alternative

Under this alternative, no new 161kV transmission circuit would be constructed between the Three Rivers and Jackrabbit Substations. As well, no new substation would be constructed between Belgrade and the Jackrabbit Auto Substation. The existing 50kV transmission lines within the Project area would remain on existing structures. However, the Trident to Belgrade 50kV transmission line would be rebuilt in the near future as a separate project. Benefits of the no-action alternative would be less environmental impacts in the short-term. These benefits would only be within the corridor between the Trident and Belgrade substations. As well, the short-term benefits could be lost and potentially compounded if the 161kV transmission line was constructed in the future after the Trident to Belgrade 50kV transmission line is reconstructed. If this scenario were to take place, potential impacts from the construction of both transmission lines would occur at different times and potentially in different geographic locations within the Gallatin Valley.

Less financial costs associated with the construction of the 161kV circuit and substation would be another benefit of no action. However, this benefit would only be incremental, since the costs associated with the Trident to Belgrade 50kV rebuild are unavoidable.

2.3.2 Proposed Action

Overview

NWE is proposing to construct a 161kV transmission line between the Three Rivers Substation north of Three Forks to the Jackrabbit Auto Substation located west of Bozeman and south of Belgrade (see Figure 1-1). The proposed Project is approximately 28.5 miles in length with 27.2 miles on private lands and 1.3 miles on Montana State trust lands managed by the DNRC. The proposed transmission line would be located for approximately 26 of its 28.5 miles along existing NWE transmission lines from the Three Rivers Substation to the Jackrabbit Auto Substation. Where the proposed 161kV transmission line would be located adjacent to the existing Trident-Belgrade-Jackrabbit 50kV transmission line, both circuits would be placed on new double circuit structures. The one exception would be from Jackrabbit Auto Substation to a point north approximately 2 miles, where the route would head east following a 90-degree angle to Jackrabbit Lane. In this area, the proposed 161kV transmission line and existing 50kV transmission line would be on separate structures.

The Proposed Route would proceed north along Jackrabbit Lane into the southern portion of Belgrade, cross a portion of state trust land, then parallel I-90 to the west until it crosses I-90. The Proposed Route would then proceed in a northwesterly direction to Manhattan. The existing 50kV transmission line located along Frank, Thorpe, and Amsterdam Roads would be abandoned. The new transmission line would be built on the second circuit of the Proposed Action.

In Manhattan, the transmission line would be located on the north side of the railroad ROW. This alignment, on the west side of Manhattan, would also be adjusted to the south approximately 80 feet to avoid close proximity to residences. The Proposed Route would then cross back to the south side of the railroad ROW west of Manhattan.

As part of this Project, NWE also proposes to install new equipment and expand the Three Rivers Substation and Jackrabbit Auto Substation. NWE would also identify a new 161kV substation site southwest of Belgrade to facilitate distribution of electricity.

The following sections detail the design specifications for the 161kV transmission line, substation upgrades and new 161kV substation. Refer to Table 2-1 for design characteristics of the 161kV transmission line.

Table 2-1 Electrical Design Characteristics of the 161kV Transmission Line

Feature	Description
Line Length	28.5 miles
Primary Structure Type	Double- and single-circuit tubular steel or wood poles
Structure Height	60-90 feet
Average Ruling Span Length	300 to 800 feet
Number of Structures per Mile	6 to 17
Right-of-Way Width	20-80 feet
Land Temporarily Disturbed	
Structure Work Area	100 x ROW width
Wire-Pulling/tensioning Sites	100 x ROW width, approx. every 3 miles
Wire-Splicing Sites	100 x ROW approx. every 3 miles
Construction Yards	To be determined in Final Plan of Development
Guard Structures	100 feet x ROW width area needed to construct guard structures adjacent to roads/electrical lines
Land Permanently Required	
Structure Base	4 x 4 feet per pole, 1 x 1 feet per each guy line (where applicable)
New Roads Required	Approximately 1 mile
Upgrade Existing Roads	Approximately 3 miles
Electrical Properties	
Nominal Voltage	161,000 volts (161kV) AC
Capacity	204 MVA
Circuit Configuration	Single circuit with 3 phases per structure, double circuit with 6 phases per structure, 1 subconductor per phase
Conductor Size	556.5 KCM, aluminum conductor steel reinforced (ACSR)
Ground Clearance of Conductor	24 feet minimum at 167°F
Communication	Fiber Optic Ground Wire in Shield Wire Position

Transmission Line Specifications

Structures

The proposed structures for the 161kV transmission line would be double circuit and single circuit tubular steel and/or wood poles. Wood poles may be round solid wood or laminated rectangular cross sections. Distribution lines would be underbuilt on the new line where feasible.

Single pole design would be used for approximately 26.7 miles of the project (refer to Figure 2-1), and would be built for most of this distance to support both the new 161kV circuit and the rebuilt existing 50kV circuit. Two circuits on one pole is referred to as a double circuit line. Double circuit poles, with a few exceptions, would be the primary structure used for 26.7 miles of the Project. 161kV single circuit poles would be used coming out of Jackrabbit Auto Substation to the north for approximately two miles parallel to NWE's existing transmission lines.

Two (2) pole H-frame structures are proposed between the Three Rivers and Trident Substations which includes the crossing of the Missouri River (refer to Figure 2-3). These structures would have a horizontal conductor configuration rather than the vertical configuration proposed for the single poles. Three (3) pole angle and dead-end structures would be used where necessary with the H-frame structures between the Three Rivers and Trident Substations and for the Gallatin River crossing (refer to Figure 2-2). No other line segment would use this type of 2-pole and 3-pole type framing. Spacing between structures would be approximately 300-800 feet, depending on terrain and other design criteria.

Typical pole heights for the tangent, dead-end and angle structures would be approximately 60-90 feet, depending on terrain. The poles would be direct embedded or installed on drilled pier concrete foundations to a depth of approximately 15 to 25 feet depending on load and soil characteristics. Pole diameter would be approximately two to three feet, depending on framing configuration and the angle to adjacent poles.

Several areas along the Proposed Route contain lower voltage distribution lines that provide electrical service to residential customers in the area. The distribution lines would be relocated to the new 161kV poles (under built) to allow for continued service to these areas without the need for an additional set of poles.

Figure 2-1 Typical Tangent Structure Designs

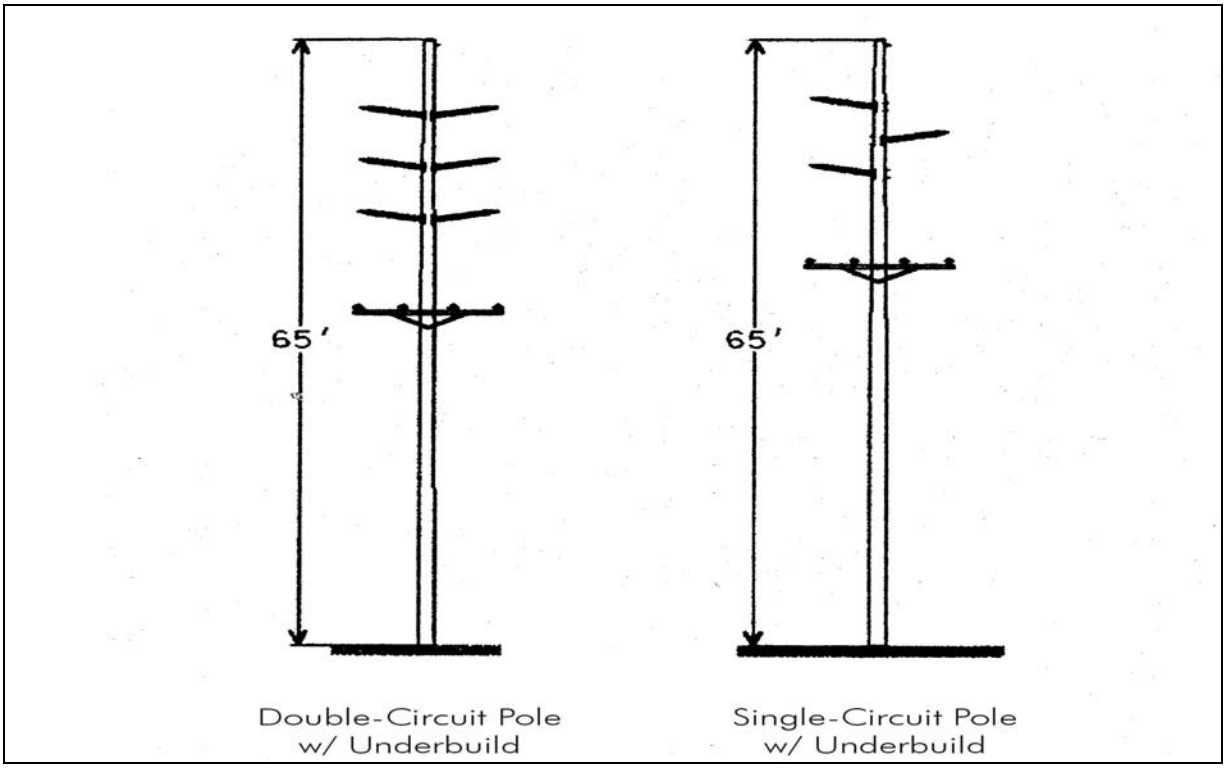
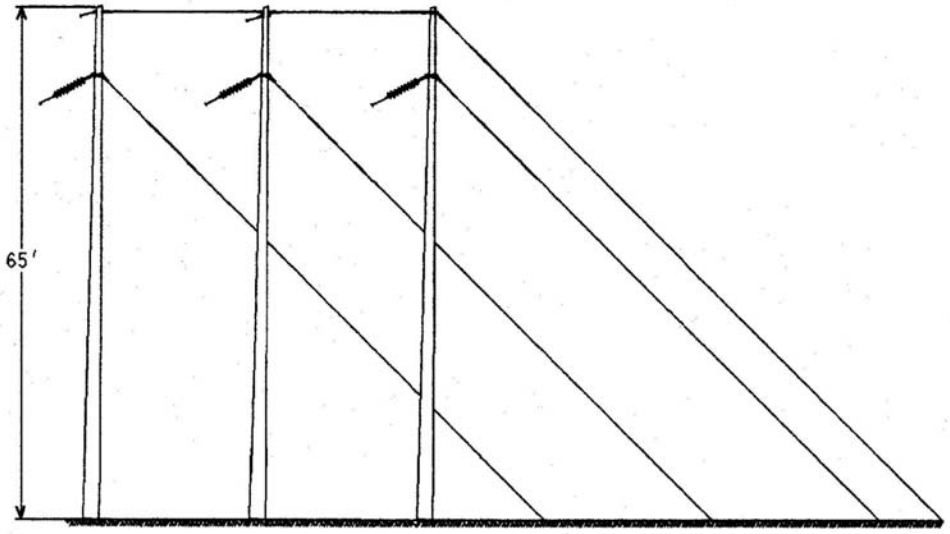
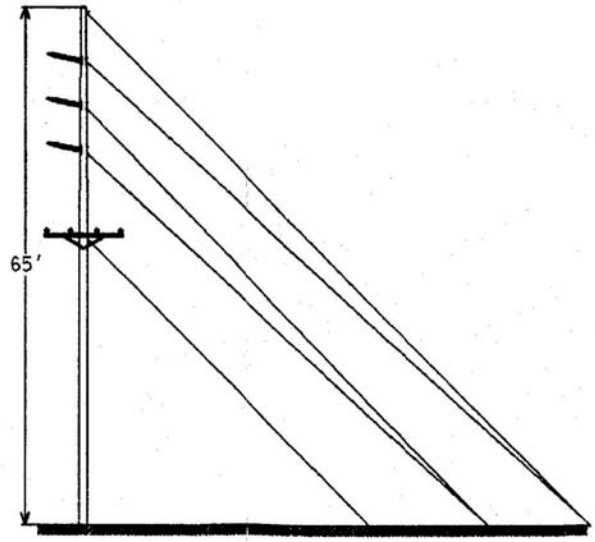


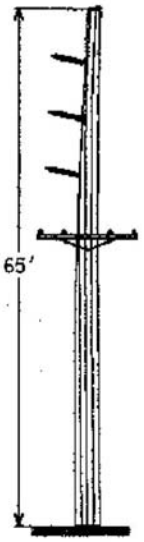
Figure 2-2 Typical Angle Structure Designs



Three Pole Guyed Angle

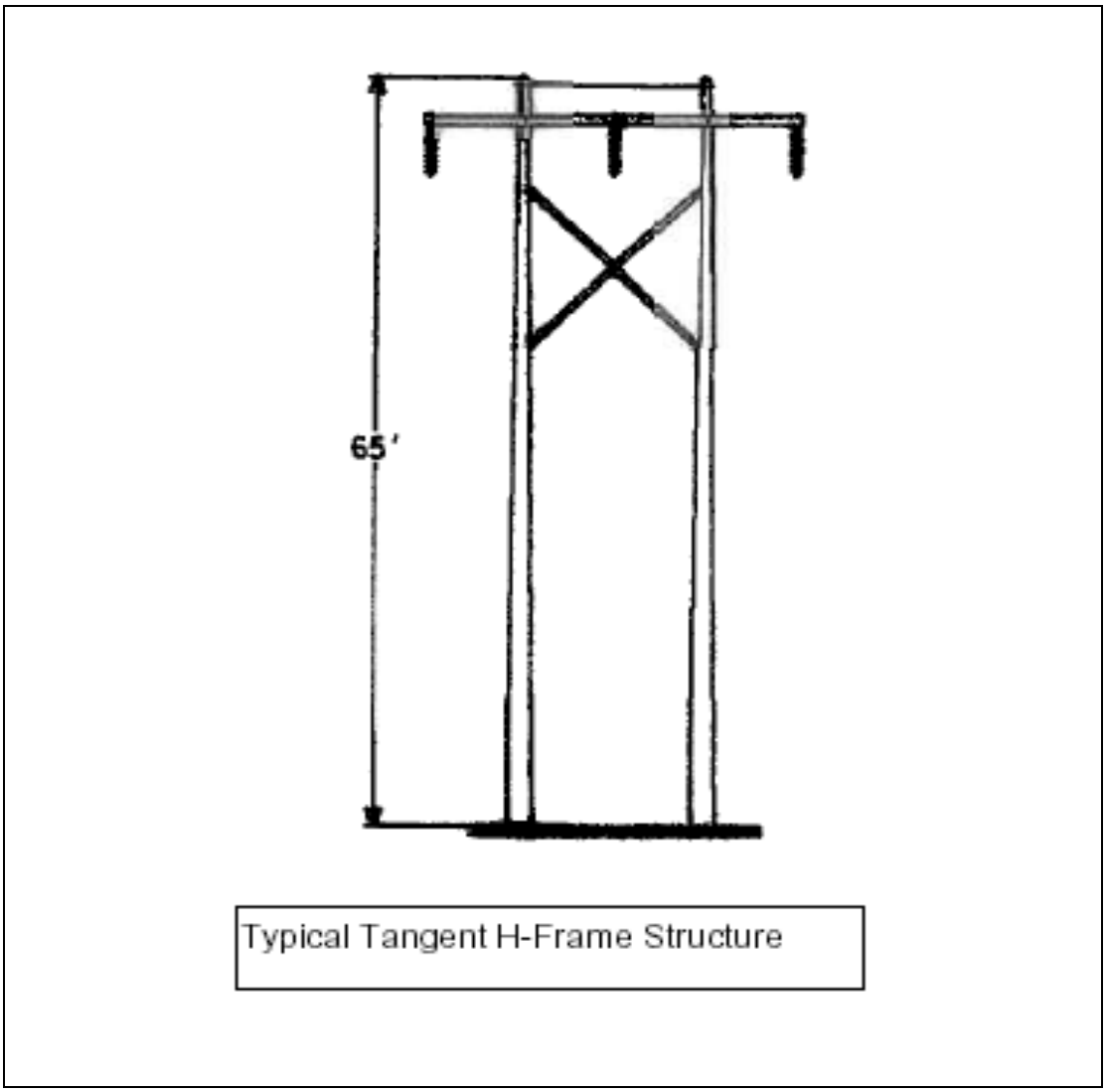


Single Pole Guyed Angle



Un-guyed Angle
Laminated Pole

Figure 2-3 Typical Tangent H-Frame Structure Design



Conductors and Associated Hardware

The 161kV transmission line would consist of three phases (six phases for double-circuit portions with 50kV), with one conductor per phase. Each conductor would be aluminum stranded with a steel stranded reinforced core. Minimum conductor height above the ground for the 161kV transmission line would be 24 feet, at 167° F, based on NESC standards and NWE standards. The distances between phases are 7 to 15 feet, depending on the structure or pole type. The H-Frame structures will typically have more separation between the conductors than the single pole design.

Fiber Optics

A single, pole top supported, fiber optic ground wire cable (OPGW) for substation-to-substation control would be installed on each structure. The outer strands would consist of aluminum wire and the entire OPGW would be approximately 0.50 inches in diameter. The fiber optic wire would be reserved for NWE use.

Right-of-Way Acquisition

Some new land rights for the transmission line ROW, temporary work areas, and permanent access roads would be required for the transmission line. NWE is requesting a grant of ROW on Montana State Trust Lands. Transmission line facilities on private lands would be obtained as perpetual easements. Every effort would be made to purchase the land and/or obtain easements on private lands through reasonable negotiations with the landowners. Land rights would be obtained in the name of NWE. If negotiations are not successful, NWE could exercise rights of eminent domain.

ROW width will vary from 40 to 80 feet, depending on the structure type and other factors. An 80 feet-wide ROW will be required for the H-Frame structures, and 40 feet is needed for the single pole design. Some of the existing ROW for the existing 50kV transmission line along Jackrabbit Lane is 30 feet wide. The ROW width along the railroad will not be defined in the agreement with the Burlington Northern Santa Fe Railroad and Montana Rail Link. Easements currently occupied by the existing 50kV transmission line along Frank, Thorpe, and Amsterdam Roads will be abandoned in the Proposed Action.

Access Roads

The proposed Project would use existing roads and trails wherever feasible for access to minimize new disturbance. The Proposed Route utilizes an existing transmission line corridor, road, and railroad ROW for most of its length. However, some amount of new access or short spur roads would be required to access new structure locations within the ROW. It is anticipated that all new access roads would be within the existing ROW. However, it is possible that portions of existing access roads located outside of this ROW would require improvements. Temporary disturbance would be approximately 14 feet wide for the access roads. Roads constructed in terrain exceeding 30% slope and along narrow terraces would cause additional temporary disturbance. However, the majority of the Project area is relatively flat terrain, with the exception of the area west of the Gallatin River crossing to the Three Rivers Substation. This area contains some relief, although very minor in areas where roads would be constructed. To minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape, the

alignment of any new access roads or cross-country routes would follow the landform contours in designated areas where practicable, providing that such alignment does not impact other resource values additionally.

Access roads would be used during construction to access work areas and during periodic maintenance of the completed transmission line throughout the life of the proposed Project. Access roads would be revegetated with grass and forb species following construction, but the road prism would remain intact for access during routine patrols and maintenance activities and for future access. Where ground disturbance is substantial, surface preparation and reseeding would occur. The method of restoration could normally consist of loosening the soil surface, reseeding, installing cross drains for erosion control, placing water bars in the road, and filling ditches.

All new access that is not desired or not required for maintenance would be closed using the least damaging methods appropriate to that area with concurrence of the landowner or land manager. Gates would be closed and/or locked, depending on the agreement with each landowner.

Work Areas

Work areas would be required at each pole site to facilitate the safe operation of equipment. The size of the work area is driven by the need to lay down the poles and frame them to the full length (60-90 feet). Within these work areas, the permanent disturbance associated with each pole would be approximately four feet in diameter. The work area outside of the permanent disturbance would be cleared of vegetation only to the extent necessary to allow for equipment to maneuver and any other ground disturbance would be limited to that necessary to safely and efficiently install the proposed facilities. Grading would only occur where the topography was too steep or uneven to allow safe operation of equipment. After transmission line construction, all work areas would be revegetated using a certified weed-free seed mix approved by the appropriate land management agency or landowner.

Pulling and tensioning sites would be required for stringing the conductor and would result in additional temporary disturbance along the transmission line.

Protection of Private Property and Resources

Existing improvements would be repaired or replaced if they are damaged or destroyed by construction activities to their condition prior to disturbance as agreed to by the parties involved. All existing roads would be left in a condition equal to or better than their condition prior to the construction of the transmission line.

Fences and gates would be installed, or repaired and replaced to their original condition prior to proposed Project disturbance as required by the landowner or the land management agency if they are damaged or destroyed by construction activities. Temporary gates would be installed only with the permission of the landowner or land management agency and would be restored to original condition prior to proposed Project disturbance following construction. Gates would be closed and locked, depending on the agreement with the agency and private landowners.

Prior to construction, all supervisory construction personnel would be instructed on the protection of ecological resources. To assist in this effort, the construction contract would address: (a) Federal, state, and local laws regarding plants and wildlife; (b) the importance of

these resources and the purpose and necessity of protecting them; and (c) methods for protecting sensitive resources.

To the extent feasible, Project facilities, including poles and access roads would be installed along the edges or borders of private property and recreation areas. NWE would consult with the landowner or land management agency to identify facility locations that create the least potential for impact to property and its uses.

All waste products and food garbage from construction sites would be deposited in a covered waste receptacle, or removed daily. Garbage would be hauled to a suitable disposal facility.

To minimize the amount of sensitive features disturbed in designated areas, poles would be placed so as to avoid sensitive features such as, but not limited to, riparian areas and watercourses and/or to allow conductors to clearly span the features, within limits of standard pole design. If the sensitive features cannot be completely avoided, poles would be placed to minimize the disturbance.

161kV Substation Specifications

A new 161kV substation would be constructed on a private eight-acre parcel of land approximately three miles south of Belgrade in Township 1S, Range 4E, Section 25. The substation would provide connection to transmission and distribution lines that service residential and commercial uses south of Belgrade and west of Bozeman.

All substation equipment would be enclosed within a seven-foot high, chain-link fence. Structures would range in height from ten to fifty-five feet and include steel dead-end towers and bus support structures.

No water or sanitation facilities would be required for substation operation and maintenance. Outside lighting would be installed for maintenance but would not be used during normal operations.

An access road would be constructed to connect the substation to Jackrabbit Lane.

Substation Upgrades

The new 161kV transmission line would originate at the Three Rivers Substation north of Three Forks and terminate at the Jackrabbit Auto Substation west of Bozeman and south of Belgrade. New equipment would be installed to accommodate the new 161kV circuit. A new terminal structure, approximately 45-55 feet tall and similar to existing substation structures, would be required. The foundations needed to support this structure are approximately six to ten feet deep. New switches and other equipment would be installed on foundations. Various bus connections and other minor equipment would be installed, as well as wiring within the control building to incorporate the new transmission line into the interconnected grid.

Transmission Line Construction

Sequence of Activities

The construction of the proposed Project would follow the sequence of: 1) centerline surveyed and staked; 2) access roads built only where necessary; 3) work areas cleared as needed; 4) materials distributed along centerline; 5) pole holes and or foundations installed and poles framed and erected; 6) OPGW ground wire, conductors installed, and 7) the site would be cleaned-up and reclaimed. Various phases of construction may occur at different locations throughout the construction process. This may require several crews operating at the same time at different locations.

Refer to Table 2-2 for the estimated personnel and equipment to be used in the construction of the transmission line.

Surveying

Construction survey work for the proposed Project consists of determining centerline location, specific pole locations, ROW boundaries, work area boundaries, and in some areas, access roads to work areas.

Access Road Construction

The utility corridor in which the proposed Project would be located has many existing trails and roads in the vicinity. However, the existing road network may require some upgrading in a few locations to allow access of construction equipment into the transmission line corridor. This may involve clearing vegetation and re-grading. Construction crews would utilize disturbed areas from maintenance and operation of the existing 50kV transmission line and railroads for as much of the access to the poles and work areas as is feasible. In construction areas where recontouring is not required, disturbance would be limited to overland driving, where feasible, to minimize changes in the original contours. Large rocks and vegetation may be moved within these areas to allow vehicle access.

Equipment to construct the access roads would include hand tools, bulldozers, graders and crew-haul vehicles. Specific actions would be implemented to reduce construction impacts. Standard design techniques such as installing water bars and dips to control erosion would be included. In addition, measures would be taken to minimize impacts such as rutting and soil compaction in specific locations and during certain periods of the year. Such conditions could arise during heavy rains.

Foundation Installation

Excavations for foundations would be made generally with power auger equipment. Where the soil permits, a vehicle-mounted power auger would be used. The foundation excavation and installation requires equipment access to the foundation sites. If rocky areas are encountered, foundations may require blasting. The foundation excavation and installation requires access to the site by a power auger or drill, a crane, material trucks, and as design dictates ready mix trucks. Concrete for use in constructing foundations would be obtained from commercial sources or from a remote batch plant on private land, depending on contractor needs.

Foundation holes left open or unguarded would be covered and/or fenced where practical to protect the public, livestock, and wildlife. Soil removed from foundation holes would be stockpiled on the work area and used to backfill holes. All remaining soil not needed for backfilling would be spread on the work area. Concrete trucks would wash their chute debris into a depression in the permanent disturbance area at the pole site and soil from the foundation excavation would be used to cover the chute debris.

If blasting were required, it would be conducted in strict compliance with safety orders or rules in force where the operation is required. All employees engaged in any operation related to the handling and the use of explosives would obtain all certification required by the state or county in which such operation is located. Accurate accounting of all explosives would be maintained, and any shortages would be reported immediately to the construction manager and to the public law enforcement authorities. No explosives would be stored on the proposed Project site. Safeguards such as blasting mats would be employed when needed to protect the adjacent property.

At heavy angled and dead end structures, cast-in-place concrete footings would be installed. Cast-in-place footings would be installed by placing reinforcing steel in the excavated foundation hole and encasing it in concrete.

Pole Tower Framing and Assembly

Wood or steel pole sections and associated hardware would be shipped to each site by truck. Wood or steel poles would be assembled at the work area. Areas need to be large enough to accommodate laying down the entire length of the poles while insulators are mounted to it. Typically, insulator strings and stringing sheaves are then installed at each ground wire and conductor position while the pole is on the ground. Stringing sheaves are used to guide the conductor during the stringing process for attachment onto the insulator strings. The assembled pole would then be hoisted into place by a crane or line truck. No helicopter assisted construction is anticipated.

Temporary construction yards may be necessary and would be located on existing disturbed areas or other areas on private lands along the transmission line route. The yards would serve as field offices, reporting locations for workers, parking space for vehicles and equipment or sites for temporary marshalling of construction materials.

Conductor Installation

Once poles are in place, a pilot line would be pulled (strung) from pole to pole and threaded through the stringing sheaves on each pole. A larger diameter, stronger line would then be attached to the pilot line and strung. This is called the pulling line. This process is repeated until the ground wire and conductor is pulled through all sheaves.

Conductor splicing would be required at the end of a conductor spool or if a conductor is damaged during stringing. The work would occur on work areas for the poles or pulling/tensioning sites.

Conductor would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end. For public protection during wire installation, guard structures would be erected over roadways, power-lines, structures, and other obstacles. Guard

structures would consist of H-frame poles placed on either side of an obstacle. These structures prevent ground wire, conductor, or equipment from falling on an obstacle. Equipment for erecting guard structures includes augers, line trucks, pole trailers, and cranes. Guard structures may not be required for small roads. On such occasions, other safety measures such as barriers, flagmen, or other traffic control would be used.

Construction Waste Disposal

Construction sites, material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Refuse and trash would be removed from the sites and disposed in an approved manner. Oils and fuels would not be dumped along the transmission line. Oils or chemicals would be hauled to an approved site for disposal. No open burning of construction trash would occur.

Site Reclamation

Work sites would be restored using excess materials, vegetation, and topsoil stockpiled for that purpose. The contractor would dispose of excess soil materials, rock, and other objectionable materials that cannot be used in restoration work.

Disturbed areas, with the exception of access roads, would be restored, as nearly as possible, to their original contour and reseeded where appropriate. Ripping and other surface scarification on construction roads or other areas would be done as necessary. In some cases the amount of soil compaction and vegetation destruction may not warrant ripping and reclamation. This would be decided on a case-by-case basis.

Table 2-2 Transmission Line Construction – Estimated Personnel and Equipment

Activity	People	Quantity of Equipment	
Survey	3	1	pickup trucks
Road Construction	1	1	bulldozers (D-8 Cat)
		1	motor graders
		1	pickup trucks
		1	water trucks (for construction and maintenance)
Direct embed pole holes and Footing Installation	5	1	hole digger
		as required	concrete trucks
		1	water truck
		1	pickup trucks
		1	line truck

Activity	People	Quantity of Equipment	
Material Haul	3	1	tractor/trailer
		2	yard and field cranes or line trucks
		1	fork lift
Structure Framing Assembly Per crew 2 crews required	4	1	pickup truck
		1	truck (2 ton)
Structure Framing Erection Per crew 2 crews required	4	1	truck (2 ton)
		1	pickup trucks
		1	bucket truck
		1	line truck
Wire Installation	8	1	wire reel trailers
		1	diesel tractors
		1	cranes
		1	line trucks
		3	pickup trucks
		2	bucket trucks
		2	3-drum pullers
		1	single Drum Puller (large)
		1	double bull-wheel tensioner (heavy)
		1	static wire reel trailer OPGW
Road Rehabilitation (Right-of-Way Restoration)	2	1	bulldozer
		1	motor grader
		1	pickup trucks
		1	water trucks

Maximum total personnel required considering all tasks (actual personnel at any one time would be less) = 24

Substation Construction

New 161kV Substation

All construction activities for the future 161kV substation would be confined to the eight-acre parcel of land.

Substation Upgrades

At the existing Three Rivers and Jack Rabbit substations, modifications would occur in areas that are already graded and surfaced. Construction work for the modifications would consist of placing new concrete foundations, extending electrical conduits for equipment power and control, and installing structures and equipment. Equipment required for substation modifications would include backhoes, drill rigs, concrete trucks, flatbeds and crew trucks. Cranes, man lifts, portable welding units, line trucks and mechanic trucks would also be required. All vehicle and equipment staging areas would be contained within existing developed areas.

Operation, Maintenance and Abandonment

Permitted Uses

After the transmission line has been energized, land uses compatible with safety regulations, operation, and maintenance would be permitted in and adjacent to the ROW. Existing land uses such as agriculture and grazing are generally permitted within the ROW. Incompatible land uses include construction and maintenance of inhabited dwellings and any use requiring changes in surface elevation that would affect electrical clearances of existing or planned facilities.

Safety

Safety is a primary concern in the design of this transmission line. An AC transmission line would be protected with power circuit breakers and related line relay protection equipment. If conductor failure occurs, power would be automatically removed from the line. Lightning protection would be provided by overhead ground wires along the line. Electrical equipment and fencing at the substation would be grounded. All fences, metal gates, pipelines, etc. that cross or are within the transmission line ROW would be grounded to prevent electrical shock. If applicable, grounding outside the ROW may also occur.

ROW Maintenance

NWE would maintain the ROW on state trust lands in accordance with state land managers' stipulations. Maintenance would be performed as needed. When access is required for non-emergency maintenance and repairs, NWE would adhere to the same precautions taken during the original construction. The same measures would be taken on private lands by contacting the landowner.

Emergency maintenance would involve prompt movement of crews to repair or replace any damage. Crews would be instructed to protect plants, wildlife and other environmental resources. Restoration procedures following completion of repair work would be similar to those prescribed

for normal construction. Limiting noise, dust and the danger caused by maintenance vehicle traffic provide for the comfort and safety of local residents.

Abandonment

At the end of the useful life of the line, if the facility were no longer required, the transmission line would be abandoned. The easements would either revert back to the landowners, or would be retained by NWE, depending on the specific terms of the easement agreements. Subsequently, conductors, insulators and hardware would be dismantled and removed from the ROW. Poles would be removed and foundations broken off below the ground surface. If the transmission line and associated ROW were abandoned at some future date, the ROW would be available for the same uses that existed prior to construction of the line.

Following abandonment and removal of the transmission line from the ROW, any areas disturbed to dismantle the line would be restored and rehabilitated as near as possible to their original condition or to the condition immediately prior to the abandonment disturbance.

CHAPTER 3

AFFECTED ENVIRONMENT

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AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter provides a description of the environment potentially affected by construction, operation, and maintenance of the proposed Project. The Affected Environment sections discuss the conditions in the natural, human, and cultural environments which could potentially be affected, beneficially or adversely, by the Project. Resources specifically affected by the proposed Project are described in Chapter 4. In addition to the general project setting, this chapter summarizes the following resource inventories:

- Wildlife and Fish
- Vegetation
- Water and Wetland Resources
- Air Quality
- Geology and Geohazards
- Soils
- Visual Resources
- Noise
- Land Use
- Transportation
- Socioeconomics
- Health and Safety
- Cultural Resources

3.2 NATURAL ENVIRONMENT

3.2.1 Wildlife and Fish

Introduction

This section addresses the environmental baseline conditions for sensitive wildlife and fish resources in the study corridor. The study corridor for wildlife and fish, vegetation, and water resources encompasses one mile on each side of the proposed Project centerline. Resources addressed in this section include special status animal species and habitat. Map 1: Biological

Resources (Appendix D) identifies special status plant and animal species and habitats relative to the Proposed Route. Potential impacts to wildlife resources are discussed in Chapter 4.

The data presented in this report were derived from existing data from the Montana Natural Heritage Program (MNHP), GAP Database, SSURGO, interviews with Montana Department of Fish, Wildlife and Parks (MFWP) biologists, and other available reports and publications.

Special status species habitat and occurrence data were obtained from the MNHP, GAP, and the Montana State Library Natural Resource Information System. These resources were also utilized to identify potential impacts from the proposed Project.

Inventory

Vegetation types primarily include agricultural lands, grassland, sagebrush, deciduous forest, forested riparian, shrub riparian, and mixed riparian. Varied wildlife species inhabit the study corridor, particularly along creek bottoms. Species present primarily include white-tailed deer (*Odocoileus virginanus)*, coyote (*canis latrans*) , skunk (*Mephitis mephitis)*, raccoon (*Procyon lotor),* and various bird species. White-tailed deer were observed during field investigations in August 2003.

Special Status Species

A search of the MNHP database identified only one special status species with potential to occur in the study corridor. The Bald eagle (*Haliaeetus leucocephalus*), is federally listed as threatened, and occurs throughout the study corridor as a year-long resident as well as spring/fall migrant. Although bald eagles occur throughout the study corridor, they generally prefer the major river corridors for roosting and foraging as well as areas adjacent to open water. Data provided from the MNHP did not identify any known nest locations within the study corridor. Prior to construction, the Montana Bald Eagle Working Group will be contacted to obtain the most recent eagle nest data available.

The Proposed Action would involve two crossings of the Gallatin River and one crossing of the Missouri River. No bald eagle roosting/perching habitat exists in the immediate vicinity of the study corridor at the Missouri River crossing or the crossing of the Gallatin River near Logan. However, these river corridors are used as a foraging area by bald eagles. Waterfowl also use these river corridors.

The crossing of the Camp Creek and associated tributaries and wetlands near Central Park contains low quality potential habitat for bald eagles. This crossing would be located between the railroad grade and I-90. In this location the cottonwood corridor is very fragmented and impacts from the railroad, frontage road and interstate highway make it less attractive for feeding areas, and nesting and roosting sites. However, wintering bald eagles have been observed perching on the 50kV transmission line across the interstate from ponds used by wintering waterfowl west of the easternmost crossing of the Gallatin River (Ring 2004).

Fisheries

The Gallatin River between Bozeman and Three Forks provides habitat for a number of fish species, none of which are federally listed or state Sensitive. The MFWP provided a list of fish

species known to be present in the Gallatin River within the study corridor (Weiss 2003). This list includes rainbow trout (*Oncorhynchus mykiss)*, brown trout (*Salmo trutta*), mountain whitefish (*Prosopium williamsoni)*, mountain sucker (*Catostomus platyrhynchus)*, long nose sucker (*Catostomus catostomus*), mottled sculpin (*Cottus bairdi*), and long nose dace (*Rhinichthys cataractae*). Similar species are expected to inhabit spring fed creeks crossed by the project between Manhattan and Belgrade.

Other Wildlife

Other common wildlife species in the project area include white-tailed deer, coyote, raccoon, skunk, blue heron (*Ardea herodias*), osprey (*Pandion haliaetus*), and other small game species.

Neotropical Birds

Potential habitat for neotropical birds exists throughout the study corridor primarily in the riparian corridors. Neotropical birds are species that breed in North America and winter in Central or South America. These species are protected under the Migratory Bird Treaty Act administered by the FWS.

Waterfowl

Waterfowl use river corridors, wetlands, and open water habitats for feeding, nesting, and resting. Wetlands, including ponds, are important waterfowl habitats, and birds use them for breeding, nesting, and rearing young. Waterfowl also use wetlands as a source of drinking water and for feeding, resting, shelter, and social interactions. Several spring fed creeks and ponds between Manhattan and Belgrade remain ice-free during winter months and provide important open water habitat for a variety of waterfowl species during these months.

3.2.2 Vegetation

Introduction

This section addresses the environmental baseline conditions for botanical resources in the study corridor. Resources addressed in this section include special status plant species, riparian resources and noxious weeds. Map 1: Biological Resources (Appendix D) identifies known special status plant species relative to the proposed Project. Potential impacts to vegetative resources are discussed in Chapter 4.

The study corridor contains a variety of landforms, soil types, and vegetation types. This variability creates habitat for numerous plant species. The Project area lies within the Northern Rocky Mountain Province. The vegetation complexes of Montana are primarily determined by topography, soil type and climate. Vegetation communities are generally associated with relatively flat, irrigated and non-irrigated farmland, recently developed farmland, wetland or riparian areas adjacent to streams and ditches, and shrubland/rangeland in the foothill areas in the northern portion of the study corridor. Riparian areas in the study corridor include forested riparian communities dominated by cottonwood (*Populus spp*.) and shrub riparian communities dominated by willow (*Salix spp*.) and dogwood (*Cornus spp*.). Wetlands in the study corridor are

generally dominated by sedge (*Carex spp*.) and/or cattail (*Typha spp*.) as well as wetland associated grass species. Rangelands in the northern portion of the study corridor include grasslands and shrublands dominated by rocky mountain juniper (Juniperus spp.) and mountain mahogany (Cercocarpus spp.).

In the study corridor habitat for several special status plant species is present. Special status plant species include federally listed species and state listed Species of Concern. These species represent species that are at risk or potentially at risk in Montana. Riparian areas are some of the most biologically productive ecosystems in nature and serve multiple functions including sediment and nutrient filtering, stream bank building, water storing, aquifer recharging, providing fish and wildlife habitat, and dissipating stream energy. These areas are also vital migration corridors for a wide variety of bird species.

These areas provide thermal cover and favorable microclimates for many terrestrial vertebrate species because of increased humidity, a higher transpiration rate, shade, and increased air movement helping in homeostasis (a condition where energy expenditure is minimized), especially when surrounded by non-forested ecosystems. Large numbers of neotropical migrant bird species use riparian habitat either exclusively or in combination with only one other habitat type.

Riparian vegetation plays a role in many physical processes within riparian areas. Vegetation shades streams and moderates water temperatures by helping keep waters cool in the summer and providing an insulting effect in the winter. Densely vegetated riparian areas buffer the input of sediment from hill slopes and filter fertilizers, pesticides, herbicides, and sediment from runoff generated on adjacent lands. Riparian vegetation also promotes bank stability and contributes organic matter and large woody debris to some stream systems, which is an important component of instream habitat.

Vegetation cover type data and special status species habitat and occurrence data were obtained from the MNHP, GAP, and the Montana State Library Natural Resource Information System.

Inventory

Special Status Species

Several special status plant species occur or have the potential to occur in the study corridor. Locations of potential habitat for the federally-listed (threatened) Ute ladies' tresses (*Spiranthes diluvialis*) occur in the study corridor near Central Park. However, a search of the MNHP database did not reveal the presence of known locations of Ute ladies' tresses in the study corridor. Ute ladies' tresses generally occur in riparian areas and wetlands including wet meadows, spring habitats, floodplains and river meanders. High potential habitat for Utes ladies' tresses was derived from soils data determined by the MNHP to have a high correlation with this species. In Gallatin County, two soil series typically have conditions suitable for Utes ladies' tresses: the Fairway-Three River complex and the Saypo series (Heidel 1998).

State listed Species of Concern with the potential to occur in the study corridor include Jones' primrose (*Primula incana*), annual Indian paintbrush (*Castilleja exilis*), small dropseed (*Sporobolus neglectus*), dwarf purple monkeyflower (*Mimulus nanus*), and slender wedgegrass (*Sphenopholis intermedia*). These species and their associated habitat are described in Chapter 4.

Riparian Woodlands/Cottonwoods

Riparian forests and mixed forest/shrub riparian areas are found throughout the study corridor associated with the major river corridors and disturbed sites near wetlands and streams. Many of these riparian corridors are relatively continuous; however some have been fragmented by development including I-90 in the central portion of the study corridor. There is very little riparian woodland at the crossing of the Missouri River. Species such as osprey, bald eagle, great blue heron, and some waterfowl are totally dependent on riparian corridors. For example, great blue heron nesting areas, or rookeries, are found in large cottonwood trees along larger rivers, as fish account for 90% of the herons' diet. Riparian areas provide travel corridors or connectors between habitat types for many terrestrial species such as carnivores, birds, and bats; and play an important role within landscapes as corridors for dispersal of plants.

The MNHP data indicates the presence of a bird rookery within the study corridor near the Missouri Headwaters State Park. Field investigations did not identify any rookeries in this vicinity.

Riparian forests are considered a high value and sensitive habitat type by MNHP ecologists (Jones, pers. Comm.).

Noxious Weeds

Noxious weeds are often early-successional, pioneer species that are very successful at colonizing disturbed area. They typically produce large quantities of easily dispersed seeds that establish quickly and grow to out-compete natives for water, nutrients and other resources. They may also spread following disturbance. Some exotic plants, in particular many noxious weeds, can become established without soil disturbance. Once introduced into an area, these species can invade intact vegetative cover and displace native plants.

General noxious weed distribution in the study corridor was determined through botanical surveys conducted in 2003. Noxious weeds are present in scattered locations throughout the study corridor including houndstongue (*Cynoglossum spp*.), Canada thistle (*Cirsium arvense*), knapweed (*Centaurea spp*.) and leafy spurge (*Euphorbia spp*.). Although most of these species are present in small numbers and low density, a robust population of knapweed was noted during field survey at the Jackrabbit Substation site. Knapweed was also noted at several locations along the study corridor particularly in state highway and county road rights of way.

3.2.3 Water and Wetland Resources

Introduction

This section addresses the environmental baseline conditions for water resources in the study corridor. Resources addressed in this section include streams, wetlands, floodplains and other sensitive water features. Map 2: Water and Wetland Resources (Appendix D) identifies water and wetland resources within the study corridor. Impacts to water resources are discussed in Chapter 4.

Wetlands can be valuable habitats that serve many important functions. Wetlands provide habitat for a vast variety of plant and animal species and can serve as a flood control mechanism. Rainwater, snowmelt and excess floodwater runoff are stored by wetlands and slowly released back into streams, lakes and ground water. Wetlands also serve as natural filters, removing sediments and some pollutants. The COE and United States Environmental Protection Agency (EPA) define wetlands as:

> Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (COE 33 CFR 328.3[8][b] and EPA 40 CFR 230.3 [t]).

Wetlands may or may not be considered jurisdictional under the Federal Clean Water Act. Recent court rulings and decisions have complicated jurisdictional determinations regarding wetlands. Current direction indicates that if wetlands are "isolated" with no surface connection to other jurisdictional waters or are not directly adjacent to another jurisdictional water, they are not considered jurisdictional and impacts to these wetlands are not subject to the COE 404 permitting process. It is important to note that although isolated wetlands may not be considered jurisdictional under the Clean Water Act, current direction at the state level indicates that isolated wetlands with standing water are considered waters of the State of Montana for regulatory purposes. There are several wetland areas located within the study corridor primarily between mileposts 13.0 and 15.0 between Central Park and Manhattan. A jurisdictional determination will be made through the consultation process with the COE and DEQ.

Floodplains store water, serve as natural sponges to moderate the release of high waters, and act as filters to trap sediments and pollutants. They reduce the velocity of rivers during high water. Periodic flooding rejuvenates and secures floodplain cottonwood forests and riparian vegetation, preventing bank erosion and offering shade, which helps moderate water temperatures and provides habitat for fish and wildlife.

Existing data including previous studies, publications and maps were used to complete the water resources and wetlands inventory. Water features were identified using USGS 7.5" topographic quad maps, aerial photography, and digital National Wetlands Inventory data. Floodplain information was obtained from National Flood Insurance Program (NFIP) maps. Inventoried features were observed in a site visit conducted in August 2003.

Water resources and water quality in the study corridor are regulated by the following authorities:

- Montana Department of Environmental Quality (DEQ)
- U.S. Army Corps of Engineers (COE)
- U.S. Environmental Protection Agency (EPA)
- Gallatin and Broadwater Counties

Inventory

Surface Waters

The major perennial rivers within the study corridor include the Gallatin River (milepost 13.0 and 20.2), Camp Creek (milepost 14.5), and the Missouri River milepost 26.8). Several man-made ponds exist near Camp Creek and the Gallatin River.

EPA regulations require all states to prepare a 303(d) list every two years based on federal Clean Water Act requirements. The goal of compiling this list is to identify impaired and threatened lakes, rivers and streams. An impaired water body is defined as "not fully supporting one or more beneficial uses." This list includes water bodies that are impaired and are in need of Total Maximum Daily Load (TMDL) development. A TMDL is the total amount of a pollutant that a given water body can receive and still meet water quality standards. Within the study corridor, the DEQ Year 2002 Montana 303(d) List includes the Gallatin River and Camp Creek. The probable causes of impairment for the Gallatin are listed as "dewatering, flow alteration, lead, and metals." The probable sources are listed as "abandoned mining, agriculture, construction, crop-related sources, highway/road/bridge construction, and resource extraction." The probable causes of impairment for Camp Creek are listed as "dewatering, flow alteration, bank erosion, channel incisement, fish habitat degradation, nitrogen, nutrients, other habitat alterations, pathogens, riparian degradation and siltation." The probable sources are listed as "agriculture, crop-related sources, grazing related sources, intensive animal feeding operations, hydromodification and channelization."

Wetlands

Several wetland areas are located within the study corridor. The majority of wetland and riparian areas occur at stream (perennial, intermittent and ephemeral) and river crossings. Many of the streams and irrigation ditches also support a fringe of palustrine wetland. Furthermore, additional well-developed wetland complexes are found in the low-lying areas adjacent to Camp Creek near Central Park and in the area near the headwaters of the Missouri River in the northwest portion of the study corridor. A low quality borrow pit wetland (between railroad grade and Interstate 90) extends from the Gallatin River crossing at milepost 13.0, approximately 1000 feet to the northwest. This wetland has been previously disturbed from road, interstate, and railroad construction activities. Several other small intermittent and ephemeral creeks and irrigation ditches are located along the corridor. Wetlands and riparian areas adjacent to streams and rivers support a range of vegetation types, including the emergent, scrub-shrub and forested classes identified by Cowardin et al. (1979). While wetlands occur in isolated locations throughout the study corridor, the nature of transmission line construction provides flexibility in avoiding many of these features.

Floodplains

Based on a review of the NFIP maps, Federal Emergency Management Agency (FEMA) delineated floodplains are present in the study corridor associated with the Gallatin River (milepost 13), Camp Creek (milepost 14.5) and the Missouri River (milepost 26.8). The 100-year floodplains associated with the proposed crossings of the Gallatin and Missouri Rivers are very narrow.

3.2.4 Air Quality

Introduction

A number of sources were reviewed in order to inventory available air and climatic data for the proposed Project. The primary sources of information were the National Climatic Data Center (NCDC), and DEQ contact via the web and personal communication. Applicable sections of Title 17 of the Administrative Rules of Montana Chapter 8 Air Quality, Sub-Chapter 3 were consulted. The Gallatin area is an attainment area for all priority pollutants.

Inventory

Results

The proposed Project location is on or near the base of the eastern slope of the Rocky Mountains. Moisture to all of the areas typically comes from the moist Pacific westerly systems. Due to the mountains, forcing clouds to drop moisture so they may rise and move over the mountains from the west, the eastern slopes and nearby plains are relatively dry. A large portion of annual precipitation comes in the form of snow.

Visibility for the region is typically excellent. The main exceptions are the occasional dust storm during the hot summer months where winds entrain dust from lightly vegetated or plowed areas. Another exception is occasional winter fog, where warm air passes over cold, snow-covered ground.

In addition to occasional fog there are infrequent calm inversion conditions, during fall and winter. These conditions allow elevated particulate matter (PM_{10}) concentrations to accumulate around urban areas. (Montana Air Monitoring Network Review 2003)

Almost the entire proposed Project is situated on private land. There are a few segments that cross State trust lands. The majority of the Project would be within existing ROW. Because of the short construction period of the Project and the fact that it is not a pollution source it would not require an air permit, as it does not qualify as a permanent area source, and is in relatively rural areas. Measured ambient air quality data for the areas crossed by the Project is minimal. However, due to the location and nature of the Project area, it is expected that ambient concentrations are well below all Montana Ambient Air Quality Standards and National Ambient Air Quality Standards (MAAQS and NAAQS, respectively).

There is a monitoring station in the Bozeman area (34 N. Rouse Ave.) and this station has monitored particulate matter PM_{10} since 1985, Total Suspended Particulates (TSP) have been monitored since 1980 and sulfate (SO_4) since 1982. These TSP monitoring devices were discontinued when the PM_{10} standard was promulgated in 1987. Bozeman has not recorded an exceedance of the PM_{10} standard, either 24 hour or annual. The site was closed in mid 2002. They are looking for a new site and there is a PM_{10} and $PM_{2.5}$ monitor currently in Belgrade. Major emissions in Bozeman and Belgrade are noted to be from paved and unpaved roads, residential wood combustion, and the sawmill in Belgrade.

The proposed site location is rural, however, there is an extremely large build-up of housing and development toward Belgrade. This adds to the dust being re-entrained into the air due to more traffic being generated. There are scattered residences along the Proposed Route. The Proposed Route would be located through Manhattan within an existing rail link. There is one major industrial source in Belgrade, a sawmill belonging to Louisiana Pacific Corporation. Also in the study corridor at Trident is the Holcim cement plant. The Holcim cement plant is located within the northwest portion of the study corridor. Holcim has submitted an application to alter their existing air quality permit to DEQ for combustion of waste tires at their Trident facility to supplement required fuel for the cement kiln. DEQ is currently preparing an EIS to evaluate air emissions and other impacts related to the use of tires as fuel.

3.2.5 Geology and Geohazards

Introduction

The study corridor is located in the Northern Rocky Mountains geographic province. This province is characterized as one of high topographic relief, with broad, linear valleys bounded by steep-shouldered mountain ranges. The high relief is a consequence of relatively recent mountain building activity.

Inventory

Stratigraphy

The study corridor is divided into two segments from a geologic perspective. The eastern segment is comprised of the portion from Four Corners to the Gallatin River crossing east of Logan. The western component traverses the uplands north of the Gallatin River, crossing the Missouri River, and thence southwest to the western terminus at Three Rivers Substation.

The eastern segment crosses the Gallatin Valley floor. The valley is underlain by material deposited in rivers and lakes that occupied the valley throughout the last 20 million years. The valley fill materials are composed of both consolidated (bedrock) and unconsolidated material (Vuke, *et al.,* 2002).

Unconsolidated material overlies the bedrock, and is composed of sediments eroded from the mountainous uplands ringing the valley. Individual beds within this sequence include bouldery gravel and sand units, with occasional thin, clayey silt beds. The unconsolidated material was deposited in alluvial fan systems adjacent to the mountains (Hackett, *et al.*, 1960).

North of the Gallatin River the study corridor traverses a series of hills underlain by folded Mesozoic and Paleozoic-age bedrock units. The rock units range in age roughly from 100 to 540 million years old (AAPG, 1983). The Paleozoic rocks consist primarily of limestone with occasional sandstone and shale beds. The Mesozoic units are generally composed of shale with minor sandstone beds (Vuke, *et al.,* 2002).

On the west side of the Missouri River, the study corridor ascends a steep hill, then bears southwest along an existing transmission line corridor to the Three Rivers Substation. The steep

hill is supported by Paleozoic limestone. The relatively flat area south of the hill is underlain by recent alluvium, the same unit as described in a preceding paragraph.

Faults/Seismicity

The study corridor is crossed by five mapped faults. Four of the faults are considered inactive. The fifth, the Central Park fault, is considered active with the most recent movement occurring within the last 1.6 million years (Stickney, *et al*. 2000). The Central Park fault is an east-northeast trending fault intercepting the study corridor approximately one mile northwest of the hamlet of Central Park. The basis for mapping the fault is an offset of a distinctive gravel layer (Hackett, *et al*., 1960). No surface expression of the fault such as scarps or offset drainages are recorded (Vuke, *et al.,* 2002). The US Geological Survey considers most of the evidence for the existence and age of this fault is circumstantial (USGS 2004).

Geohazards

The study corridor traverses generally flat to moderately steep terrain underlain by either generally well-drained alluvium or folded bedrock (refer to Soils section below for a more detailed description). Most of the bedrock units are composed of sandstone and limestone, and are not considered a risk for mass movement. North of the Gallatin River Cretaceous-age bedrock units are composed primarily of shale. These units outcrop on moderate slopes, and may be subject to mass movement and/or creep when saturated. The likelihood of this occurring along undisturbed portions of the study corridor is low. No active landslides are mapped in the area.

The study corridor is located in Seismic Zone 2b on a scale of 0 to 4, where 0 is the least seismic risk and 4 the greatest risk (Stickney, *et al*., 2000). Zone 2b includes areas of greater than 10% probability that an earthquake with peak ground accelerations of 20% to 30% of the acceleration of the force of gravity (0.2 to 0.3 g) will occur in a fifty-year period.

Seismic events of this magnitude may result in ground shaking, liquefaction, and/or surface rupture. Due to the lack of well-documented active faults, the likelihood of surface rupture along the right-of-way is low.

Seismic events along other faults in the region are much more likely. These events may cause ground shaking and liquefaction, especially in the shallow, saturated sand intervals in the Gallatin River alluvium. These deposits occur in a two-mile long zone northwest of Central Park, and in a narrow band along the Gallatin River east of Logan (Vuke, *et al.,* 2002).

Shallow groundwater may occur in low-lying areas underlain by recent alluvium. This condition may be most prevalent during the high spring runoff period and in the summer due to recharge of the shallow aquifer because of irrigation practices.

3.2.6 Soils

Introduction

Soils found within the study corridor fall into three broad descriptive categories: 1) deep, well drained soils on flood plains, adjacent stream terraces, and alluvial fans; 2) deep, poorly drained

soils on flood plains, outwash plains stream terraces, and depressions; and 3) shallow, well drained soils on hills, ridges, escarpments, and sedimentary plains.

Inventory

Methods

Soils data and related information were acquired from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). This information came in the form of two soil surveys entitled *Soil Survey of Gallatin County Area, Montana and Soil Survey of Broadwater County Area, Montana.* Additional related data were acquired online through the NRCS website. Relevant soils and their characteristics have been inventoried and described.

Results

The NRCS data indicates that 68 detailed map units occur in the study corridor.

Three types (soil orders) of soils dominate soil resources in the study corridor. These are Mollisols, Entisols and Inceptisols. Mollisols are characterized by significant accumulations of organic matter (humus) in the surface soil horizon thus making this soil horizon dark in color. These soils are typically associated with grassland vegetation and are often arable. Entisols are generally young soils. They show little or no diagnostic horizon development and have minimal amounts of organic matter. These mineral soils would likely occur on steep slopes or flood plains that receive alluvium deposits at frequent intervals. Inceptisols are also relatively young soils. They display only very weak soils horizon development. Additionally, rock outcrop and riverwash areas occur in the study corridor.

Within the study corridor, water erosion potential ranges from low to moderate, while wind erosion potential ranges from moderate to severe. Activities that remove vegetation and cause soil surface disturbance tend to increase soil erosion rates. Erosion rates would depend on site-specific characteristics including soil type, disturbance level and topography. Topography especially influences water erosion potential. Water erosion rates typically increase with increasing slope.

Prime farmland and farmland of statewide importance occur in the study corridor (see Impacts to Land Use Table in Appendix A for specific locations crossed). Prime farmland, as defined by the NRCS, are those soils best suited to producing food, feed, forage, fiber, and oilseed crops. Farmland of statewide importance is generally those soils that nearly meet the definition of prime farmland. These soils are delineated by appropriate state agencies. Detailed map units considered prime farmland are:

- Enbar loam, 0 to 4 % slopes
- Straw loam, 0 to 4 % slopes

Additionally, 13 detailed map units would be prime farmland if irrigated.

Detailed map units considered farmland of statewide importance are:

- Amesha loam, 4 to 8 % slopes

- Kalsted sandy loam, 8 to 15 % slopes
- Brocko silt loam, 4 to 8 % slopes
- Chinook fine sandy loam, 8 to 15 % slopes
- Chinook-Kalsted sandy loams, 8 to 15 % slopes
- Beavwan loam, 0 to 2 % slopes

3.2.7 Visual Resources

Introduction

The study corridor has a wide range of natural and man-made features that contribute to the aesthetics of the area. Community features include single-family residences, clusters of residences, the cities of Belgrade and Manhattan, and unincorporated areas of Gallatin County including the communities of Central Park and Logan. Major facilities in the area are comprised of I-90, Gallatin Field Airport, 50kV, 161kV and 230kV transmission lines, two major substations, and agricultural buildings and related equipment. Two small portions of BLM public lands occur near the proposed Project. Rivers, creeks and streams, seasonal drainages, riparian woodland, annual grasslands, field agriculture and large patchy mosaics of sagebrush influence the natural setting of the study corridor.

A 3,000-foot wide study corridor (1,500 feet each side of the proposed transmission centerline) was inventoried to document existing visual resources. The study process included analysis of recent topographic maps and aerial photography, contacts with agencies, field reconnaissance surveys and review of existing literature sources. The result is a consistently inventoried database used to assess visual impacts for the Project in Chapter 4.

Inventory

The inventory consists of the following three major components:

- Regional Setting/Landscape Character Type Inventory
- Viewer Sensitivity Inventory
- Seen areas mapping

Methods

A map at a scale of 1” equals 2 miles was used in compiling the visual resource database within the study corridor. Visibility mapping was conducted from sensitive viewpoints using a GIS system that utilized digital elevation models (DEMs) to determine which portions of the landscape, including the proposed Project, could be seen from sensitive viewpoints nearby. Landscape visibility distance zones were field verified within the foreground and middle ground distance zones. For analysis, visibility from sensitive viewpoints and the locations where visibility occurs was mapped for foreground (0-500 feet), middle ground (500-1,000 feet) and

background (1,000 – 1,500 feet) distance zones. Sensitive viewpoints are shown on Map 3: Visual Resources (Appendix D).

Regional Setting

The study corridor is almost all within the Gallatin River Valley and would traverse broad alluvial valleys, rolling hills and gentle foothill within the study corridor. The proposed Project would be constructed on new transmission poles approximately 60 to 90 feet in height (see Project Description, Chapter 2). The landscape setting of the study corridor allows for views that are vast and expansive in the valleys to limited and focused within heavy over story vegetation near the river crossings and nearby topographic relief. There are a comparatively small number of high sensitivity viewers present along most visible portions of the study corridor.

The mountains of southern Montana, specifically the Three Forks District, are described as "Almost anywhere in these mountains a dominating level of summits may be observed, although it varies in altitude from place to place ranging from 7,000 to 10,000 ft. Higher masses also rise above it. The valleys, except the tertiary basins, are generally canyon but in the southern part of the Madison Range these young valleys, carved since the last uplift, have not wholly destroyed the older, smoother, soul-covered surface with moderate slopes and small relief." (Fenneman 1931).

The study corridor consists of smooth, rolling plains that have rounded slopes and shallow, comparatively broad tertiary valleys with occasional terraces near the major rivers. Elevations range from about 4,000 feet at the Three Rivers Substation to 4,700 at the Jackrabbit Auto Substation.

Visual Sensitivity/Distance Zones

Sensitivity levels were assigned to each inventoried viewpoint. All residences were identified as having a high sensitivity to changes. Viewpoints within the Missouri Headwaters State Park were also assigned as highly sensitive to changes seen in their visual environment. Moderate viewer sensitivity included general use roadways and highways. Low visual sensitivity viewpoints were identified but not carried forward for analysis. Following is a discussion for each of the inventoried viewpoint categories found within the visual study corridor.

Residences

All residences are considered the "high sensitivity" category due to high concern (user attitude) and long view duration. Foreground to middle ground residential visibility of the transmission corridor occurs from milepost 1.9 to 19.7. Middle ground visibility occurs intermittently from milepost 23.6 to 25.9.

Parks and Recreation Areas

Missouri Headwaters State Park is located in the northwest portion of the study corridor. Individual use and large gatherings occur at this location, resulting in "high viewer sensitivity" (high use volume, high user attitude, and moderate viewing durations). Foreground and middle ground and background views occur from Missouri Headwaters State Park from milepost 26.2 to

26.6. Foreground views from dispersed recreation areas occur from milepost 14.8 to 15.2 where dispersed recreationists visit the Gallatin River near the community of Central Park.

Foreground views from dispersed recreation areas also occur from milepost 20.1 to 20.7 where dispersed recreationists visit the Gallatin River. The existing 50kV transmission line crosses at this location near Logan. Dispersed recreation viewpoints have a moderate viewer sensitivity due to the comparatively low use volume, moderate to low duration of view and high to moderate user attitude. Foreground views from dispersed recreation areas also occur from milepost 26.3 to 26.8 where dispersed recreationists visit the Missouri River near the Missouri Headwaters State Park.

Travel Routes

Interstate 90 and Montana Route 85 both carry large amounts of traffic throughout the Gallatin Valley. These roads have a moderate to low viewer sensitivity due to the low user attitude, short duration of view, and high user volume.

User attitude is described as the anticipation of the user to expect above average scenery to be seen from a particular viewpoint. In the case of Interstate 90 within the project area, travelers are moving from place to place and expect to arrive expeditiously upon a national interstate highway. Travelers typically choose interstate highways for their ability to quickly move motorists throughout the nation. Conversely, any route that carries the official designation of a scenic highway tends to attract motorists for the sole purpose of scenery viewing.

Highways that occur in the project area are not designated as scenic highways. Views from Interstate 90 occur in the foreground distance zone from milepost 7.3 to 15.6. Views from Montana Route 85 occur in the foreground distance zone from milepost 2.3 to 6.9. Views from Route S-286 occur in the foreground distance zone from milepost 26.3 to 26.8 where motorists travel the road to visit the Missouri Headwaters State Park. Views from Route S-286 are classified as having moderate visual sensitivity due to the high to moderate user attitude, low use volume, and short view duration. User attitude for motorists traveling Route S-286 is higher due to the expectation of historically relevant scenery within Missouri Headwaters State Park.

3.2.8 Noise

Introduction

Audible Noise

Noise sources and levels are described and inventoried in this section for the study corridor. This study corridor would include the Proposed Action, and the existing 50kV transmission lines.

There are no federal noise standards that directly regulate noise from operation of electrical transmission lines and substation facilities. However, it should be noted that the EPA has developed guidelines on recommended maximum noise levels to protect public health and welfare (U.S. EPA. 1974). With regard to noise exposure and workers, the Occupational Safety and Health Administration (OSHA) regulations safeguard the hearing of workers exposed to

occupational noise. Refer to 29 CFR Section 1910.95 (Code of Federal Regulations) for a list of permissible noise exposures.

Montana encourages each local government entity to perform noise studies and implement a noise element as part of their growth policy. There are no specific noise ordinances for Gallatin and Broadwater Counties.

Radio Noise

Radio and television interference (denoted as RI and TVI and collectively referred to as Radio Noise or RN) is a phenomenon produced by both corona and sparking and can vary greatly based on weather conditions. Corona occurs when the electrical field at a particular point reaches a sufficiently high value to cause ionization of the surrounding air.

Corona is primarily a concern during foul weather because it is more likely to occur when water droplets are on or dripping off the transmission line conductors. The effect of corona on RN is most evident in the AM broadcast band of 0.535 to 1.605 MHz. Generally, only broadcast signals in weak signal areas show interference due to coronal activity during foul weather. Cable and satellite systems are not susceptible to corona. Properly designed transmission lines can greatly reduce the effects of corona. In addition, corona is primarily a concern for transmission lines operating at 345kV and higher. The Project would operate at 161kV and 50kV.

Inventory

Audible noise is produced from a number of existing transmission lines and substations in portions of the study corridor. These include a 50kV transmission line in the study corridor from approximately milepost 9.0 to a location between milepost 26.0 and milepost 27.0, a 100 kV transmission lines that are in the study corridor from a location east of milepost 27.0 to Three Rivers Substation, and a 230kV transmission line from a location west of milepost 26.0 to a location west of milepost 25.0.

The Three Rivers and Jackrabbit Substations and proposed substation sites along the study corridor would produce audible noise. Sources of audible noise within the substations include equipment such as transformers, reactors, voltage regulators, circuit breakers and other intermittent noise generators.

Ambient noise from vehicular traffic (Jackrabbit Lane and Montana Route 84) and the operation of agriculture equipment would dominate the environment near the proposed substation and Jackrabbit Auto Substation.

Natural noise sources includes wind, which is much more common than calm conditions, and is expected to be in the range of 45 to 55 dBA.

Sensitive Receptors

Noise-sensitive receptors are facilities or areas (e.g. residential areas, hospitals, schools, offices) where excessive noise may cause annoyance or loss of business. There are several residential structures adjacent to the study corridor with the highest concentration of residences in Manhattan and near Belgrade. The largest number of residences located within 300 feet of the study corridor is located between milepost 3.0 and milepost 4.0, between milepost 6.0 and

milepost 7.0, between milepost 10.0 and milepost 11.0, and between milepost 16.0 and milepost 17.0. There are also several commercial structures adjacent to the study corridor with the highest concentration in Manhattan and near Belgrade.

The Lewis and Clark National Historic Trail and the Missouri Headwaters State Park are located within the study corridor, generally along the Missouri River. Two Town of Manhattan parks (Taylor Park and Railroad Park), along with play facilities located on school grounds (Altenbrand Park), are identified within the study corridor.

Noise Sources

Vehicular Traffic

Route S-286 crosses the study corridor approximately one mile east of the Three Rivers Substation. Route S-346 crosses the study corridor at Manhattan. Interstate 90 is adjacent to the study corridor from a location approximately one mile east of Manhattan to Belgrade where the interstate continues to the east and the study corridor turns to the south. Route S-347 crosses the study corridor southwest of Belgrade. The study corridor is adjacent to Jackrabbit Lane (Montana Route 85) from Belgrade to Jackrabbit Auto Substation. U.S. Highway 191 and Montana Route 84 are perpendicular to the study corridor north of Jackrabbit Substation. Interstate 90 is the primary vehicular source of noise near the study corridor.

Railroad

The Montana Rail Link is located within the study corridor from milepost 8.0 to milepost 20.0 and from milepost 26.0 to milepost 26.6.

Airport

The Gallatin Field Airport is northeast of Belgrade and is approximately two miles from the study corridor.

Industrial Facilities

The Holcim-Trident cement plant and hard rock (limestone, sandstone and shale) mining operation (Trident Quarries) is located in the northwest portion of the study corridor between milepost 26.0 and milepost 27.0.

Radio and Television Interference

In the U.S., there are no established standards for radio and television noise interference. For transmission lines with normal spacings and right-of-ways, a fair weather RI level of about 40 dBμV/m (100μV/m) at a lateral distance of 100 feet from the outermost phase has been established as a guideline for identifying a design criteria for a RN limit (IEEE Standard 430-1991).

The U.S. electric power companies have been able to operate quite well under the present Federal Communication Commission (FCC) rule because harmful interference can generally be eliminated. It has been estimated that more than 90% of power line sources, which cause

interference, are due to spark discharges. These can be found and eliminated when required to prevent interference. Very few of the interference complaints that power companies in the U.S. receive are due to corona (Rennie 2003).

3.3 HUMAN ENVIRONMENT

3.3.1 Land Use

Introduction

The land use inventory was conducted during August and September 2003 as well as in January 2004. Existing data, containing land cover and uses, was obtained and utilized from the Montana Natural Resources Information System (NRIS) Geographic Information System (GIS). National Aerial Photograph Program (NAPP) 1: 20,000 scale 1995 black and white aerial photography was also used. The existing mapped information was subsequently verified by ground reconnaissance during August 2003 and January 2004. Federal, state, and local land resource agencies were also contacted during this time to update official information and to solicit further input.

The information collected within the study corridor (1 mile wide along the Proposed Route) was organized into four inventory categories: (1) Land Jurisdiction and Ownership, (2) Existing Land Uses, (3) Planned Land Uses, and (3) Parks, Recreation, and Preservation Areas. Study corridor information was then transferred to Map 5: Land Use (Appendix D), at a scale of 1 inch = 2 miles. An Agricultural Uses map (Map 4-Appendix D) was also created to help more clearly define these features from the Land Use map.

Inventory

Land Jurisdiction and Ownership

The study corridor for the 28.5-mile proposed Project lies primarily in the northern half of Gallatin County, west and northwest of the City of Bozeman. A small portion of the study corridor is also located in southern Broadwater County. The majority of the proposed Project (27.2 miles) would cross private land while 1.3 miles would cross Montana State Trust land. Montana State Trust land includes lands under the administration of the MDNRC. Montana State Trust lands are administered and managed for the benefit of the public schools and other endowed institutions in Montana, under the direction of the State Board of Land Commissioners. The Real Estate Management Bureau of the Trust Land Management Division is responsible for reviewing and processing applications for rights-of way and easements across surface lands and navigable waterways administered by the state.

The Town of Manhattan incorporated area is located within the study corridor and is crossed by the Proposed Route for approximately 0.8 miles. The Proposed Route comes in close proximity to the southern and western incorporated area boundary of the City of Belgrade.

Existing Land Uses

Agriculture and Grazing

Agriculture is a predominant land use within the study corridor. Agricultural land refers to pasture and irrigated and dry croplands. Approximately two miles of the Project would cross agricultural land (see the Land Use Impact Table in Appendix A). Included in this amount are two locations of Montana state trust land leased for agricultural purposes. The first location is approximately one-half mile northeast of the Three Rivers Substation in Broadwater County. This land is currently leased for grazing purposes. The second location is immediately southwest of Belgrade and is leased for agriculture purposes. Here the proposed line would be located on the boundary of land irrigated with hand lines and land irrigated with side-roll sprinkler systems. It is also one of the most promising properties that the trust has for development due to the land's proximity to Belgrade and its potential for annexation. Annexation is likely as a result of the City's intent to extend services south of I-90 (Anderson 2004, Menicucci 2004).

Crop type at any one location in the study corridor is variable and occasionally in fallow. Data on the actual crop types grown in the study corridor was not available. As such, crop data was obtained from the Montana Department of Agriculture at the county level. Specific irrigation methods used in the study corridor (center pivot, wheel line, flood) also vary depending on soil properties, topography, and cost. Generally, irrigated agricultural land within the study corridor is used for alfalfa/hay, small grains or potatoes. Pasture was dry, sub-irrigated, and irrigated. Along the rivers the pasture was sub-irrigated and dryland mixed (Carlstrom 2004).

Other forms of agricultural production include dairy and intensive livestock (one confined hog operation), cattle and horse grazing, as well as beehives and apiaries. The Montana apiary program is administered through the Montana Department of Agriculture, which registers apiary sites in the state.

Agricultural lands were determined and mapped using existing Montana Natural Resource Information System data and 1: 20,000 scale 1995 black and white aerial photography. This information was updated with the assistance of the Gallatin County Extension Agent. Major crops in Gallatin County are wheat and barley, with 49,000 acres and 36,700 acres planted in 2002, respectively. Other crops produced in Gallatin County include potatoes, corn and hay. Major crops in Broadwater County are wheat and barley as well, with 38,500 acres and 8,700 acres planted, respectively. Other crops produced in Broadwater County include potatoes and dry beans.

Certain lands within the study corridor have been classified by the NRCS as prime farmland for the protection of farmland being converted to nonagricultural uses. Prime Farmland is defined by the Farmland Protection Policy Act (FPPA) as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary.

Lands within the study corridor have also been classified by the FPPA as Farmland of Statewide Importance. These lands are defined as farmland, other than prime or unique farmland, that is of statewide or local importance for the production for food feed, fiber, forage, or oilseed crops, as

determined by the appropriate State or unit of local government agency or agencies, and that the Secretary determines should be considered as farmland.

Areas classified as Prime Farmland if irrigated and Farmland of Statewide Importance are crossed by the Proposed Route. Locations of these classified lands are found in the Land Use Impact Table located in Appendix A.

No Conservation Reserve Program (CRP) land was identified in the study corridor.

Twenty registered commercial apiary sites were identified in the study corridor.

According to the Gallatin County Growth Policy, agriculture's contribution to the overall economy is declining. Total net income from farming and ranching dropped from $31.1 million in 1970, to $7.1 million in 2000. In many cases, it has become more profitable to subdivide the land for housing rather than farm or ranch.

Residential

Residential uses are present within the study corridor. Primarily located near Belgrade (2000 Census population of 5,728) and in Manhattan (2000 Census population of 1,396), the number of residential subdivisions and homes continues to increase at a high rate. The study corridor, located just west of Bozeman, is one of the fastest growing areas in the state of Montana.

According to the Gallatin County Growth Policy, from 1990 to 2000, Gallatin County's population increased by 34.4 percent, ranking Gallatin County the fifth largest Montana county and the second fastest growing county. By the year 2030, the Gallatin County population is expected to be 116,000, representing a 30-year increase of nearly 50,000 people (refer to the Socioeconomic section for more growth-related information).

The Growth Policy also states that from 1990 to 2000, the Gallatin County Commission gave final approval to 323 minor and major subdivisions, for a total of 31,144 lots. Continued development and subdivision activity is expected as the population growth continues in Gallatin County.

According to the Belgrade Area Plan, the Belgrade City-County Planning Jurisdiction has been one of the fastest growing areas in Montana in the past decade. Over 2000 subdivision lots have been approved in Belgrade and its 4.5-mile planning jurisdiction, since 1990. Within this area is a broad mixture of residential development, including site built homes and manufactured homes. The area east of the Gallatin River and north of Amsterdam Road is almost completely developed with subdivisions.

The community of Central Park, scattered non-farm residences, as well as farm and ranch operations are also located in the study corridor.

Subdivisions, including residential and commercial crossed by the Proposed Route, are identified in the Land Use Impact Table located in Appendix A. New residential and commercial subdivisions (Northstar, Galactic Park, and Commerce Park) are planned north and northwest of the Jackrabbit Substation.

Commercial and Industrial Uses

Commercial development can be found in or around Belgrade. This development is generally located south along Montana Route 85, I-90, Main Street, and Route S-205. Commercial development can also be found in Manhattan along Main Street (central business district) and at the corner of Broadway/Churchill Road and Wooden Shoe Lane, near the on/off ramps of I-90. Manhattan is located in the study corridor and is built around the Montana Rail Link ROW. The proposed centerline is located on the north side of the railroad track in an area zoned as light industrial.

The proposed centerline would cross two commercial subdivisions (Minor Subdivision 190 and Garden Center Subdivision) just north of the Jackrabbit Substation.

The Holcim-Trident cement plant is located in the northwest portion of the Project, northeast of Missouri Headwaters State Park. A Holcim (US) Inc. hard rock (limestone, sandstone and shale) mining operation (Trident Quarries) is also situated in this area. The operating permit includes a permitting area consisting of the following locations: Township 2 North, Range 2 East, Sections 3, 4, 9, 10, 13, and 24. An exploration license has also been issued for Township 2 North, Range 2 East, Section 13.

Linear Features

Major linear utilities located within the study corridor include electrical transmission lines and a railroad. NWE currently owns and operates several transmission lines ranging in voltage from 50kV to 230kV within the study corridor. In addition, the Montana Rail Link leases railroad track from the Burlington Northern Santa Fe Railway within the study corridor. The Montana Rail Link is a regional Class II railroad serving more than 100 stations in Montana, Idaho and Washington. The main railroad is situated in a major utility corridor containing I-90, Montana Route 205 (frontage road) and the Trident-Belgrade 50kV transmission line.

Communication Facilities

Commercial cellular towers were identified in the study corridor near I-90 between Belgrade and Manhattan.

Planned Land Uses

The Gallatin County Growth Policy was adopted on April 15, 2003. The growth policy replaces the Gallatin County Plan, as directed by a bill passed by Montana Legislature in 1999. The law specified the replacement of existing master plans and comprehensive plans throughout the state with a "growth policy." The purpose of the growth policy is to provide general direction for decisions relating to land use, such as zoning and subdivisions. The county does not have any zoning regulations or special/conditional use permit requirements for transmission lines.

Broadwater County (2000 Census population of 4,385) also has adopted a growth policy. The Broadwater County Growth Policy was adopted in July of 2003. Broadwater County also does not have any zoning regulations or special/conditional use permit requirements for transmission lines.

The City of Belgrade Area Plan was adopted by the Belgrade City-County Planning Board on May 19, 1999 with a Future Land Use Map amended on August 26, 2002. The primary goal of the Belgrade Area Plan is to improve the efficiency of land use in the Belgrade City-County Planning Jurisdiction by concentrating development within and adjacent to Belgrade. As the distance increases from the City, the Plan encourages the preservation of farmland, open space, and protection of the East and West Gallatin Rivers. The Future Land Use Map generally identifies development densities of high and medium within the study corridor. Belgrade is currently developing a growth policy. Adoption of the growth policy is anticipated in 2005 (Karp 2004). Belgrade currently does not have a comprehensive plan, zoning regulations or special/conditional use permit requirements for a transmission line.

The Town of Manhattan Growth Policy is currently nearing completion. Goals and objectives were adopted in November 2003, while maps and text were adopted in February 2004. Information such as population projections, town history, as well as subsequent final document printing, remains to be completed. Adoption of the entire document is anticipated in July 2004 (Johnson 2004). Manhattan does not have any special/conditional use permit requirements for transmission lines.

Belgrade and Town of Manhattan both have plans for annexations in the study corridor.

Parks, Recreation, and Preservation Areas

The Three Forks of the Missouri National Historic Landmark is located in the northwest portion of the study corridor. The National Historic Landmark was listed on the National Register of Historic Places in 1966. Boundaries have not been established for either the National Historic Landmark or National Register of Historic Places due to lack of landowner agreement and/or landowner objections (Wegman-French 2004). More information on the National Historic Landmark is described below in 3.4 Cultural Resources.

The Lewis and Clark National Historic Trail crosses the study corridor, generally along the Missouri River. The trail is part of the National Trails System and is administered by the U.S. Department of the Interior, National Park Service. National Historic Trails recognize prominent past routes of exploration, migration, and military action and generally consist of remnant sites and trail segments and are not necessarily continuous. The Meriwether Lewis and William Clark expedition reached the Pacific Ocean at the mouth of the Columbia River in 1805 and returned east in 1806. Although National Historic Trails are administered by federal agencies, land ownership is both public and private. Private landowners may voluntarily have the trail through their land certified, however, none have chosen to do so within the study corridor. In 2000, the Lewis and Clark National Historic Trail was included as a Millennium Trail.

The Missouri Headwaters State Park, managed by Montana Fish, Wildlife & Parks, is located in the northwest portion of the study corridor, approximately ½ mile southeast of Three Rivers Substation. The 530-acre park encompasses the confluence of the Jefferson, Madison, and Gallatin Rivers. The Montana Primitive Park Act of 1993 established the park as a "Primitive Park" because of its' unique and primarily undeveloped character. The park is also a Land and Water Conservation Fund site. This undeveloped park provides outdoor interpretive signs, picnic spots, short hiking trails (4.1 miles), and a small campground (23 sites). Visitors to the park in 2003 totaled 69,759, which made the park the 6th most visited park in the Montana Fish, Wildlife

& Parks system. Visitation to the park has increased in the last few years and is expected to increase through 2004-2006. This increase will most likely be due to the Lewis and Clark Bicentennial (Shelton 2004). A small extension (22-25 acres) of the park, towards the east-southeast, is possible in the future and is currently being discussed (Heagney 2004). There are currently two transmission lines crossing the northern portion of the park. These are the Anaconda-Billings 230kV and 161kV transmission lines. However, according to section 23-1-117 of the 1993 act, the installation of electric lines or facilities is prohibited within primitive parks. The proposed centerline would not cross the Missouri Headwaters State Park or possible extension.

It is a goal of the Gallatin County Growth Policy to *"provide adequate local services and public facilities"* and a policy to *"require development to comply with plans for parks, recreation, open space and trails."* To help accomplish this goal and policy, the Gallatin County Planning Board appointed a volunteer advisory committee to develop a comprehensive county trails plan. *The Gallatin County Trails Report and Plan* was adopted by the Commission as a part of the Growth Policy on January 3, 2002 by Resolution 2002-04. Further, Gallatin County intends to develop a comprehensive county park, recreation and open space plan, and upon completion, to amend the Growth Policy to adopt recommendations of the plan (Gallatin County Growth Policy). Some proposed trails and potential trail corridors were identified within the study corridor from Gallatin Trails Advisory Committee maps. These maps indicated that these proposed trails and potential trail corridors were intended to illustrate only general connections between existing trails and do not define specific trail locations. Easements for these proposed trails and potential trail corridors currently have not been acquired and some of their locations may change (Scott 2004).

Two Manhattan parks (Taylor Park and Railroad Park), along with play facilities located on school grounds (Altenbrand Park), were identified within the study corridor. Taylor Park is a dedicated park/recreational complex intended to service the major recreational needs of the community. The park is also a Land and Water Conservation Fund site. Railroad Park provides passive open space with a lawn, picnic tables, landscaping and a gazebo. Railroad Park has not been dedicated. None of these parks and play facilities located on school grounds are crossed by the Proposed Route.

Four conservation easements are located within the study corridor. These conservation easements are held by either the Montana Land Reliance or Gallatin Valley Land Trust. A conservation easement is a deed granted by a landowner to a land trust for protection of the land from certain types of development. The conservation easement remains in effect regardless of any change in property ownership. The proposed centerline would cross a conservation easement held by the Montana Land Reliance northwest of Manhattan. The crossing of the easement would be within the existing Trident-Belgrade 50kV transmission line ROW.

Other recreational activities within the study corridor are dispersed and include hunting, fishing, and wildlife viewing. A Manhattan Game Closure area (private) is also located within the study corridor approximately 2 miles southeast of Manhattan. By order of the Montana Fish, Wildlife & Parks Commission, this area is closed to hunting, harassment or molesting of migratory waterfowl.

3.3.2 Transportation

Surface transportation in the study corridor is provided by a network of National Highway System-Interstate, National Highway System-Non Interstate, Primary, Secondary, and local roads. Interstate 90 crosses through the central portion of the study corridor in an east-west direction. Interstate 90 is located within a major utility corridor crossing Gallatin County including a railroad, and transmission line. Average daily traffic on I-90 between Belgrade and Manhattan was 12,120 vehicles in 2002 (Montana Department of Transportation 2002). Other roads include U.S. Highway 191, Montana Routes 84 and 85, and Routes S-205, S-286, S-288, S-346 and S-347.

Although not within the study corridor, the Gallatin Field Airport is located east of Belgrade. The Gallatin Field Airport is the 7th busiest passenger airport in the Pacific Northwest with over a half million passengers using the facility every year (http:/www.gallatinfield.com/flightschedules.asp)

3.3.4 Socioeconomics

Introduction

This section addresses several interrelated areas of interest and concern regarding the proposed Project. This socioeconomic assessment evaluates the likely short-term and long-term Project-related effects on population, economic welfare, and public services such as emergency health services, or fire protection, as well as the likely effects on local fiscal conditions caused by the proposed Project.

Inventory

History and Population

The Project is located in Gallatin and Broadwater Counties, located in southwestern Montana. Only a few miles of the transmission line would be located in Broadwater County, and since this area of Broadwater County is rural and relatively unpopulated, this assessment focuses primarily on Gallatin County and its communities.

Gallatin County is the most populated and fastest growing county in southwest Montana. The County Seat of Bozeman had a year 2002 population of 29,459, while the county population was 71,206. Table 3-1 shows available population data for the counties and communities near the Project.

Table 3-1 Historical population trends, Gallatin County, Broadwater County, and Towns, Cities, and Census Designated Places (CDPs) Near the Project.

	1990	1995	2000	July 1, 2002	% Growth, 1990-2002
Broadwater County	3,318	3,976	4,385	4,366	31.6%
Gallatin County	50,463	60,644	67,831	71,206	41.1%
Town of Three Forks	1,203	n/a	1,728	1,775	47.5%
City of Belgrade	3,411	n/a	5,728	6,588	93.1%
Town of Manhattan	1,034	n/a	1,396	1,421	37.4%
City of Bozeman	22,660	n/a	27,509	29,459	30.0%

Source: U.S. Bureau of the Census, census estimates, indicated years.

Note: n/a means unavailable estimates.

Population projections call for continued moderate population growth through the year 2025, a near doubling over the period from 2000-2025 for Gallatin and Broadwater Counties, and slower rate for the state as a whole. Population projections are displayed in Table 3-2.

Table 3-2 Population projections, Gallatin and Broadwater Counties and the State of Montana, 2000-2025 (Years 2000-2002 are Census Data).

	Montana	Broadwater County	Gallatin County
2000	902,195	4,385	67,831
2002	915,250	4,530	70,820
2003	924,570	4,600	72,090
2004	933,570	4,680	73,350
2005	942,580	4,760	74,570
2010	989,190	5,140	80,430
2020	1,092,730	5,920	91,750
2025	1,148,770	6,320	97,340
Percent Change, 2000-2025	27.3%	44.1%	43.5%

Source: NPA Data Services, Inc., December 2003.

Housing

The housing market in the area exhibits a moderate degree of tightness. In the year 2000, 10.8 percent, or 3,416, of its available housing units were vacant, according to the U.S. Bureau of the Census. However, netting out vacant housing units for seasonal, recreational, or occasional use, the net vacancy rate was 5.3 percent (vacancy rates under 5 percent indicate some housing market tightness). Vacancy rates for owner units and renter units were 1.8 and 5.7 percent, respectively, in Gallatin County. Housing data are displayed in Table 3-3.

Table 3-3 Housing Data, Broadwater and Gallatin Counties and Selected Towns and Cities, Year 2000.

	Broadwater County	Gallatin County	City of Belgrade	City of Bozeman	Town of Manhattan	City of Three Forks
Total housing units	2,002	29,489	2,239	11,577	582	726
Vacant units	250	3,166	107	700	29	40
Vacant housing units for seasonal, recreational or occasional use	119	1,723	13	100	2	5
Owner vacancy rate, percent	1.8%	1.8%	1.5%	2.1%	1.7%	1.5%
Rental vacancy rate, percent	9.1%	5.7%	6.4%	4.9%	8.0%	7.7%
Single Unit [1]	147	1,957	24	295	22	27
Multiple Unit [1]	25	962	84	408	6	11
Mobile home, trailer, other [1]	78	247	0	15	2	3
Value, owner-occupied housing units; Median (dollars)	$85,000	$143,000	$110,200	$137,300	$116,700	$92,400
Contract monthly rent; Median (dollars)	$323	$494	$522	$494	$445	$440

Source: U.S. Bureau of the Census, Census 2000.
[1] Vacancy Units

Consistent with the proposed Project area's history as a tourist destination and business center, the area has extensive hotel/motel accommodations. An Internet Yellow Pages search was performed to identify all hotel/motel and RV park facilities within 25 miles of Belgrade, and resulted in 58 hotel/motels, and 6 RV parks. Addressing hotel/motels and RV parks within 25 miles of Bozeman revealed listings for 85 hotel/motels, and 8 RV parks.

Employment and Economy

The relevant area used for the description of employment and economy is Gallatin and Broadwater Counties. This area is used as the relevant labor market area, from which the proposed Project is expected to draw much of its construction and operation labor forces. However, the remainder of the State of Montana is likely to supply some of the construction work force, and is also used for comparison.

Gallatin County has a relatively large, diverse, and historically rapidly growing economy. County employment has grown on average every year since 1990, even including the recessionary years of 2000-2001. In December 2003 the county unemployment rate (preliminary estimate) was 3.3%, compared to the statewide rate of 5.0%, and a national rate of 5.4% (Montana Department of Labor and Industry, undated-A).

Originally the Gallatin County economy was based primarily on agriculture and mining, and the agriculture sector remains significant though shrinking. Although agriculture related employment has been shrinking as the county has urbanized, farm and "agricultural services, forestry, fisheries, and other" still accounted for about 4.0% of total county employment in the year 2000; this is lower than the state average of 7.7%, but significant nonetheless. Services, retail trade, and

government are the largest three private sectors in Gallatin County. The high proportion of construction employment (9.4% of the total) reflects its relatively high rate of population growth, and Gallatin County's position as a source of construction personnel for nearby areas. The proportional distribution of employment in Gallatin County is quite similar to the statewide distribution.

Broadwater County has a relatively small economy, employing only about 2,100 people in the year 2000. Services, manufacturing, retail trade, and farming (farm and agricultural services were 19.7 percent of the total) employment were the largest sectors. Employment by industry data are shown in Table 3-4. In December 2003 the county unemployment rate (preliminary estimate) was 5.8% (Montana Department of Labor and Industry, undated-A).

Table 3-4 Employment by Industry, 2000: State of Montana, Gallatin and Broadwater Counties.

	State of Montana		Gallatin County		Broadwater County	
Type of Employment	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
Farm employment	32,579	5.8%	1,193	2.3%	325	15.4%
Ag. services, forestry, fishing and other	10,818	1.9%	891	1.7%	90	4.3%
Mining	6,515	1.2%	173	0.3%	89	4.2%
Construction	35,045	6.2%	4,832	9.4%	104	4.9%
Manufacturing	29,217	5.2%	3,154	6.1%	372	17.6%
Transportation and public utilities	28,076	5.0%	1,539	3.0%	75	3.5%
Wholesale trade	20,497	3.7%	1,693	3.3%	57	2.7%
Retail trade	105,230	18.8%	10,793	20.9%	243	11.5%
Finance, insurance, and real estate	37,377	6.7%	3,562	6.9%	87	4.1%
Services	171,589	30.6%	15,328	29.7%	407	19.2%
Government and government enterprises	84,051	15.0%	8,503	16.5%	266	12.6%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, 2003.

Per capita personal income in Gallatin County grew steadily between 1990 and 2001, reaching $26,442 in 2001, an increase of 69.1 percent over 1990.[1] This is higher than the state average of $24,044 and the statewide growth of 55 percent. Broadwater County per capita personal income was below that of Gallatin County over this period ($18,955 in 2001), and grew more slowly

[1] Although county-level inflation factors are unavailable, the U.S. Bureau of Labor Statistics estimated that nationally, inflation for all urban residents rose 35.5% between 1990 and 2001. However, it should be emphasized that the national inflation factors are not necessarily applicable in the study area of the Proposed Project.

(38.3 percent) than either Gallatin County or the state as a whole, reflecting the more rural nature of Broadwater County (U.S. Department of Commerce).

Employment projections for the State of Montana show that its employment is expected to continue to grow through the year 2010. Total employment is projected to increase by 2010 by an annul average of 1.6% relative to the base year of 2000. The wholesale trade and construction sectors are projected to grow the most quickly over this period, by 32.3% and 32.0% respectively (Montana Department of Labor and Industry, undated-B).

Public Services

This section addresses public services most likely to be directly affected by the proposed Project. The relevant services are police and fire protection, emergency medical, and hazardous waste response.

In Gallatin County, the relevant police department for the Project is the Gallatin County Sheriff's Department. The County Sheriffs Department employs 40 officers, and has 36 police cars. There are an average of 2.5 cars on the road (one officer per car), 24 hours a day.

The Gallatin County Department of Emergency Services is the primary responder to any hazardous spills within the county. They respond to hazardous materials requests by police departments or fire districts having jurisdiction in the location of any events. The Department also performs notifications as appropriate to the DEQ and/or the Montana Department of Disaster and Emergency Services (DES). The Department handles the entire county in a joint agreement between Gallatin County and City of Bozeman. For actual cleanup, the parties responsible for any events are responsible for actual cleanup, generally through private cleanup companies.

The relevant fire districts would be Belgrade, Manhattan, Three Forks, and Gallatin Gateway.

All but Belgrade are volunteer departments, not staffed. Belgrade has salaried firefighters and is staffed.

In Broadwater County, police services are provided by the Broadwater County Sheriffs Department. The Department employs seven full-time and six reserve officers. Between one and four Sheriff's vehicles are on patrol at any one time. Primary response in case of fire would likely be the Three Forks Fire Department, and the Toston Fire District. Emergency medical services in the area are provided by those organizations as well. The County has an emergency coordinator for dangerous materials events who acts as coordinator, in much the same way as described above for Gallatin County.

3.3.5 Health and Safety

Introduction

Electric and magnetic fields (EMF) are present wherever electricity flows: around appliances and power lines, in offices, schools, and homes. Electric fields are invisible lines of force, created by voltage, and are shielded by most materials. Units of measure are volts per meter (V/m). Magnetic fields are invisible lines of force, created by electric current and are not shielded by

most materials, such as lead, soil and concrete. In the U.S., magnetic field strength units of measure are Gauss (G) or milliGauss (mG), where 1,000 mG = 1G. Much of the world scientific community measures magnetic field strength in units of Tesla (T) and microTesla (μT) where 10,000 G = 1 T, 1G = 100 μT, and 1mG = 0.1 μT. Electric and magnetic field strengths diminish with distance. These fields are low energy, extremely low frequency fields, and should not be confused with high energy or ionizing radiation such as X-rays and gamma rays.

Inventory

Electric and magnetic fields from power lines can cause effects that occur beyond the confines of the phase conductors. The fields produce small amounts of electric charge on nearby conductive objects, an action known as coupling or induction. Magnetic fields primarily impact long and generally parallel objects (e.g., fences and pipelines) that have an electrical ground at some point of the object. Electric field effects are more likely to occur on objects well insulated from ground at all points. Good examples are motor vehicles and metal sheds that can acquire electric charges in an electric field. The primary issue is how the induced or coupled voltages and currents on these objects can compromise safety to a person who comes in contact with the object. The National Electrical Safety Code (NESC) requires that power lines be designed to keep the induced current from nearby objects below 5.0 mA when short-circuited to ground. The short circuit current can be calculated for any object in or near the corridor to determine if the magnitude of the current is below the 5.0 mA rule for safety purposes.

A majority of people in the United States is exposed to magnetic fields that average less than 2 milliGauss (mG). Table 3-5 depicts estimated average magnetic field exposure of the U.S. population for residential sources, according to a study commissioned by the U.S. government as part of the EMF Research and Public Information Dissemination (EMF RAPID) Program. This study measured magnetic field exposure of a sample of people of all ages randomly selected among the U.S. population. Participants wore or carried with them a small personal exposure meter and kept a diary of their activities both at home and away from home. Magnetic field strength values were automatically recorded twice a second for 24 hours. The study reported that exposure to magnetic fields is similar in different regions of the country and similar for both men and women.

The existing 50kV transmission lines between Trident, Belgrade and the Jack Rabbit Auto Substation are comprised primarily of single poles with a triangular configuration. The lines have a 12.5 kV distribution circuit underbuilt below the transmission line for much of their alignments. Magnetic field strengths were calculated for the existing lines at two locations, the section of line in Manhattan, and along Jackrabbit Lane south of Belgrade. The 50kV transmission line near Manhattan is comprised of span lengths (between two adjacent transmission line structures) of approximately 200 feet. The maximum load in 2003 for this portion of the 50kV transmission line was estimated to be 104 amps. The 12.5kV distribution circuit was estimated to have a maximum load of 150 amps. The maximum magnetic field strengths are 11 mG and 5 mG for distances of 20 feet and 40 feet from the centerline of the transmission line respectively. The 50kV transmission line along Jackrabbit Lane south of Belgrade is comprised of span lengths of approximately 250 feet. The maximum load in 2003 for this portion of the 50kV transmission line was estimated to be 158 amps. The 12.5kV distribution circuit was estimated to have a maximum load of 60 amps. The maximum magnetic

field strengths are 6 mG and 3 mG for distances of 20 feet and 40 feet from the centerline of the transmission line respectively. Figures 3-1 and 3-2 depict the plots of the calculated magnetic field strengths for the 50kV transmission lines at Manhattan and in Belgrade at Jackrabbit Lane, respectively.

Figure 3-1 Transmission Line Magnetic Field Strength for Existing 50kV Transmission Line Near Town of Manhattan

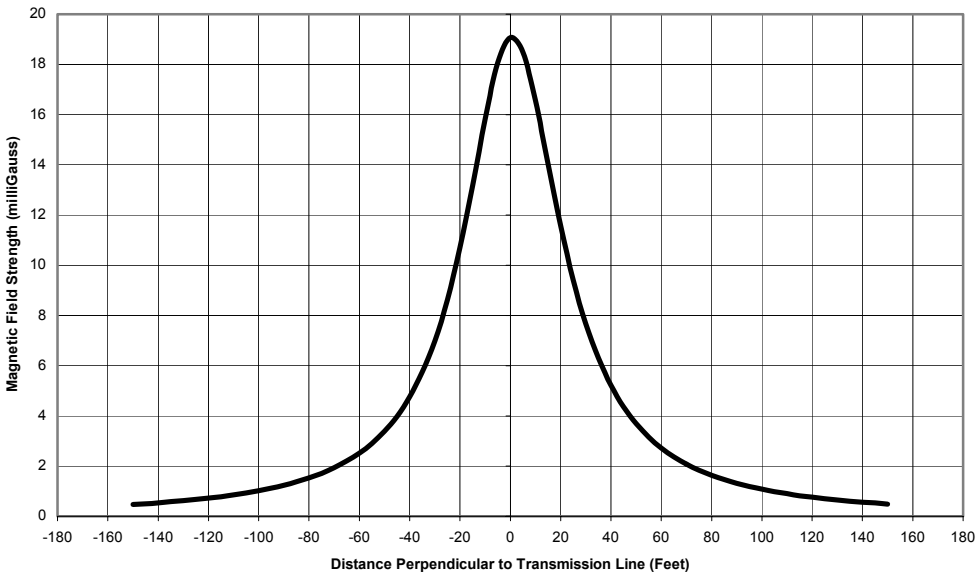


Figure 3-2 Transmission Line Magnetic Field Strength for Existing 50kV Transmission Line at Jackrabbit Lane

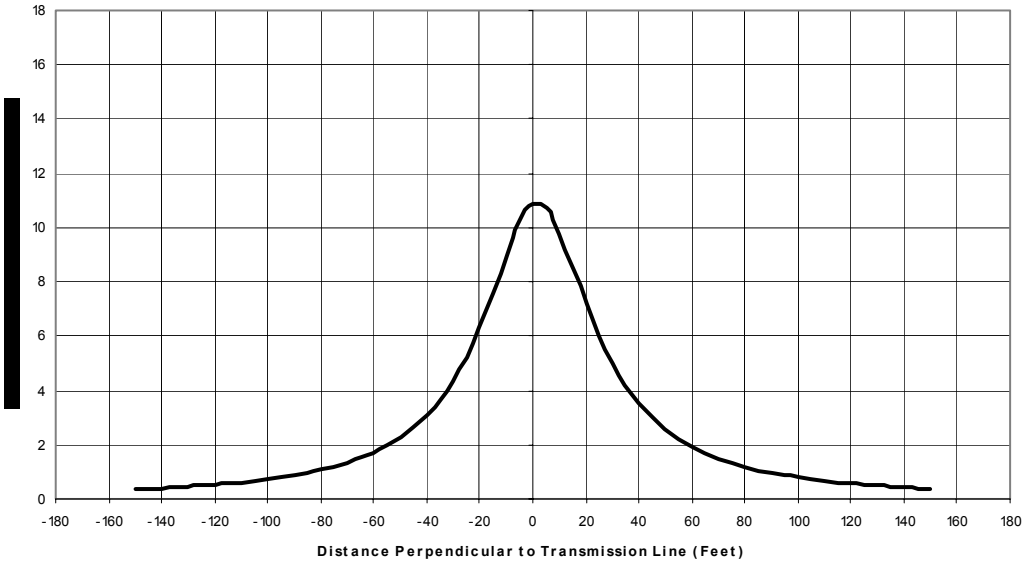


Table 3-5 Residential Sources of Magnetic Fields

SOURCE	Magnetic Field Strength[2] (mG)
Kitchen	
Blenders	20
Coffee Makers	1
Dishwashers	30
Electric Ranges	30
Refrigerators	20
Bedroom	
Digital Clock	8
Analog Clock	30
Living/Family Room	
Color Televisions	20
Window Air Conditioners	20
Ceiling Fans	50
Laundry/Utility	
Electric Clothes Dryer	3
Washing Machines	30
Vacuum Cleaners	200
Portable Heaters	40
Workshop	
Drills	40
Power Saws	300

Source: "EMF Questions & Answers", U.S. National Institute of Environmental Health Services, EMF RAPID Program, 2002.

3.4 CULTURAL ENVIRONMENT

3.4.1 Cultural Resources

Introduction

Cultural Resource studies for the proposed Project included a Class I inventory for public lands along the proposed transmission line centerline. These lands are under the administration of the MDNRC, and are located in Township 2N, Range 2E, Section 8, and in T1S, R4E, Section 11 (Study Areas). The MDNRC manages public lands in portions of both these sections.

This Class I inventory included:

- search of the Montana *Cultural Resource Annotated Bibliography System* (CRABS);

[2] The magnetic field strengths are measured at a distance of one (1) foot from the source.

- search of the Montana *Cultural Resource Information System* (CRIS);
- search of the University of Montana, Archaeological Site Records, Missoula, Montana;
- *search of the National Register Information System,* maintained by the National Park Service, and
- consultation with the Archaeologist-MDNRC.

A file search was also conducted by the DEQ of records on file with the SHPO along the proposed transmission centerline.

Results

Searches of the Montana CRABS and CRIS files by the Montana State Historic Preservation Office (SHPO) reported that a single cultural property was located in the Study Areas. The SHPO reported property 24GA0212, the "*Three Forks of the Missouri National Historic Landmark*", as being within the designated search locale of T2N, R2E, Section 8.

Review of the record form for property 24GA0212, on file with the University of Montana Archaeological Records Office, reveals that the location of this property is recorded as follows (emphasis added).

"T2N, R2E, S½ of Section 8; Section 9; Sec, 17, N½; Sec 20, W½, NW¼; Sec 21".

The lands under study in the Class I Inventory are located in the NE ¼ of T2N, R2E, Sec 8, and thus, are outside the described boundary of property 24GA0212.

A search was made of the National Park Service's electronic database for NRHP listed properties and National Historic Landmarks in Montana for the specifics of the listing of property 24GA0212.

The *National Register Information System* (NRIS) includes property 24GA0212 and notes it's listing in 1966:

> *MT, Gallatin (County) Three Forks of the Missouri NE of Three Forks on the Missouri River, Missouri Headwaters State Monument Three Forks 1966-10-15.*

The National Historic Landmarks database includes the following listing for this property:

Missouri Headwaters State Park

> National Register Number: 6000433
>
> Resource Type: Site
>
> Property type: Landscape – natural feature

Contact was made with the Archaeologist for the MDNRC regarding any record the agency had of either known cultural properties or previous cultural resource inventories in the Study Area. The MDNRC Archaeologist reported that no previous inventories were on file with the agency and recommended that a resource inventory be conducted prior to line construction on all state-administered, public lands. Specific to Section 8, T2N R2E, he stated that:

Currently, I have no record of any cultural resources having been identified on the subject state parcels. However, I can find no evidence that the NE/1/4 of Section 8, T2N R2E has ever been inspected for cultural resources. Because prehistoric chert quarries are known to exist in areas adjacent to the area of potential effect, I am recommending that the proposed transmission line route be inventoried for cultural resources before construction activities begin.

The file search conducted by the DEQ of records on file with the Montana SHPO is summarized below. It is important to note that the fact that a property appears in the file search returns, does not necessarily mean that the Proposed Route would actually cross the specific property at any or all of the locations at which a property is identified. None of the listings in the file search returns identify the location of a specific property at any greater detail than the quarter section in which it was recorded. A majority of the listings do not even identify the quarter-section locations of properties, or are listed as being in "combined" (presumably multiple) quarter sections. It is also important to note that much of the Proposed Route would be within an existing transmission line ROW. Construction of the original transmission line would have resulted in land-disturbing activities. The settings of most cultural properties in the file search return then, likely already include an electric transmission line.

Nine historic railroad properties and eight irrigation "systems" were identified in the file search. In most cases the Proposed Route would have no effect on these linear properties, where the proposed 161kV transmission line would merely span them. Approximately 12 miles of the Proposed Route runs along existing railroad grades. Addition of the proposed 161kV transmission line to these grades would have no effect, inasmuch as they would not disturb the railroad grade or require relocation of rail lines. Also, addition of the proposed 161kV transmission line would not introduce any element out-of-character with the industrial setting of the railroad lines. Historically in Montana, electric and other utility lines were sited on and along railroad grades. No transmission line structures would be located in irrigation ditches, and no such facilities would require relocation in order to construct the proposed 161kV transmission line.

Three bridges were identified in the file search. If the bridges are actually located along the Proposed Route, there would not be any effect to them, since the line would merely span them. The MDOT would consider these two properties in their review of any permit applications submitted by NWE for use of highway rights-of-way for transmission line construction.

One historic residence was identified in the file search. It is recorded as privately owned and the NRHP status is reported as undetermined. However, the location given for this property does not record more detail than the quarter section within which it was recorded. If the residence were located on or adjacent to the Proposed Route, it is not likely that it would be affected by the proposed 161kV transmission line, inasmuch as routing of the proposed 161kV transmission line would have not included any removal or relocation of it. Two historic farmsteads are identified in the file search. Both are privately owned and the NRHP status of them is undetermined. One of these is only reported to consist of "historic outbuildings". The listing for the other property, 24GA1626, includes no details on what actually constitutes this property. However, the location given for these properties does not record anything other than the quarter section within which they were recorded. It is not likely that either would be affected by the Proposed Route, inasmuch as routing of the line would have not included any removal or relocation of any buildings or structures which might compose either property. One historic log structure was

identified in the file search. It is privately owned and its NRHP status is undetermined. However, the location given for this property does not record anything other than the quarter section within which it was recorded. It is not likely that it would be affected by the Proposed Route, inasmuch as routing of the proposed 161kV transmission line would have not included any removal or relocation of it.

Two historic commercial properties (assumed to be buildings or structures) were identified in the file search. The NRHP status of one of these properties is listed as unresolved and the other as ineligible for NRHP listing. Unfortunately, there is no data in the search on the specific nature and extent of either of these properties. One property (24GA0811) is listed as "Historic, Euro-American", " Historic Travel-Railroad Stage Route", and then includes the notation of "Prehistoric-More Than One Period." The location is given as being in combined quarter sections. However, the specific combination of quarter sections is not identified. It is listed as state owned, with a NRHP status of undetermined. The agency administering the public lands on which this property is located is not identified. Assuming this is a linear property, the proposed 161kV transmission line would have no effect on these linear properties, since the proposed 161kV transmission line would merely span them. One historic gas station is listed in the file search. It is listed as privately owned, with a NRHP status of Undetermined. Routing of the proposed 161kV transmission line would have not included any removal or relocation of it.

Two prehistoric lithic scatters are identified in the file search. One of these has no identification as the specific quarter section in which it is located. It is identified as "Prehistoric-Late Period", with a NRHP status as undetermined. The other property listing includes the quarter section and is identified as "No Indication of Time", with a NRHP status as undetermined.

Table 3-6 Summary of Properties Returned in DEQ File Search

Property Number	Property Type	Ownership	NRHP Status
24GA1069	Historic Railroad	MDOT Other	Undetermined
24GA1399	Historic Railroad	Other	CD
24GA1571	Historic Railroad	State Owned	Ineligible
24GA1572	Historic Railroad	No Data	Unresolved
24GA0803	Historic Bridge	MDOT	Undetermined
24GA1065	Historic Bridge	MDOT	Undetermined
24GA1067	Irrigation System	Private	Undetermined
24GA1357	Irrigation System	Private	Undetermined
24GA1096	Historic Railroad	Private	CD
24GA1395	Historic Railroad	Private	CD
24GA1095	Historic Railroad	Private	CD
24GA1539	Historic Residence	Private	Ineligible
24GA1556	Historic Commercial	Private	CD
24GA1557	Irrigation System	Private	Unresolved
24GA099	Historic Railroad	Private	CD
24GA0728	Historic Agriculture	Private	Ineligible
24GA0741	Irrigation System	Private	Unresolved
24GA0743	Irrigation System	Private	Unresolved
24GA0812	Historic Railroad	Private	Undetermined
24GA1505	Historic Commercial	State Owned	Ineligible

Property Number	Property Type	Ownership	NRHP Status
24GA0655	Prehistoric Lithic Scatter	No Data	Undetermined
24GA0679	Prehistoric Lithic Scatter	No Data	Undetermined
24GA0668	Tipi Ring	No Data	Undetermined
24GA0982	Irrigation System	Private	Undetermined
24GA0970	Historic Residence	Private	Undetermined
24GA0971	Historic Farmstead	Private	Undetermined
24GA0742	Irrigation System	Private	Undetermined
24GA1662	Historic Log Structure	Private	Undetermined
24GA1507	Historic Bridge	MDOT	Undetermined
24GA1627	Irrigation System	Private	Undetermined
24GA0811	Historic Euro-American	State Owned	Undetermined
24GA0973	Historic Gas Station	Private	Undetermined
24GA1626	Historic Farmstead	Private	Undetermined

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

The potential environmental consequences, or impacts, described in this chapter are based on the environmental effects that would result from the proposed Project. Construction, operation and maintenance of a new transmission line may impact resources with the addition of permanent pole sites and access roads. However, most of the Proposed Route would be located within an existing transmission line/railroad ROW on previously disturbed land. Potential impacts from the proposed Project were assessed for those resources described in Chapter 3. The various types of impacts that could occur were defined and impact locations were identified for each resource.

NWE used an iterative process to identify potential impacts and measures to reduce the identified impacts. This began with screening several alternative routes to find a location that would avoid as much impact as practicable. The Proposed Route would use an established utility and transportation corridor, and was refined in several areas to avoid residences (e.g., near Manhattan and south of Belgrade). As the routing studies were underway, resource specialists began to analyze impacts of the project (also refer to Appendix A).

Where impacts were identified, an evaluation was conducted to determine if one or more measures to reduce impacts would be effective in avoiding or reducing (e.g., intensity and/or duration) the potential impact. These measures are included in the description of the Project proposal in Chapter 2 and consist of measures or techniques NWE would employ to avoid or minimize potential impacts. Measures required to meet state and federal laws and regulations are described in the following chapter. In the following sections, impacts are described assuming these measures were applied. No identifiable impact would occur if the Proposed Action does not trigger any changes to resources.

4.2 NATURAL ENVIRONMENT

4.2.1 Wildlife and Fish

Introduction

This section describes the types of impacts that would occur and effects of those impacts on sensitive biological resources from construction and operation of the proposed Project. Measures to reduce potential impacts proposed to sensitive biological resources are also discussed.

Impact Results

Special Status Species -Bald Eagle

Activities related to transmission line construction, such as road building, pole setting, and conductor stringing could disturb foraging, roosting, or nesting eagles in the area. Construction commotion impacts would be limited to the period during which the proposed Project would be constructed.

Although the level of construction commotion necessary to produce adverse impacts to wintering or nesting bald eagles has not been quantified, it is possible that during the winter months (i.e., November 1 through April 30), individual eagles could be disturbed by construction activities and flushed to other perches or roosts in the area.

Although MNHP data did not indicate the presence of any known Bald eagle nests in the study area, potential nesting habitat does exist. Prior to construction the Montana Bald Eagle Working Group will be contacted to obtain the most recent eagle nest data available.

For nesting eagles, construction commotion could stress the birds and interfere with breeding and rearing activities if construction took place during the sensitive nesting period (Pope 2000). If construction occurred during the nesting period from when nesting is initiated to about a month after hatching (typically from February 1 to July 15), it is likely additional stress would be placed on the birds. Whether this disturbance would be enough to cause the eagles to abandon the site is not clear, but it is likely that flushing from the nest would occur in at least a few instances. In extreme cases, excessive commotion could cause temporary or permanent abandonment of the nest. To eliminate the potential for this impact and comply with the Endangered Species Act, NWE would modify or curtail non-emergency construction restoration, maintenance and termination activities during sensitive periods such as nesting and breeding for candidate, proposed, threatened, and endangered species.

Isaacs et al. (1992) conclude that an 800-meter, no-activity buffer around active bald eagle nest trees from February 1 to July 15 should protect the birds from excessive stress and avoid impacts to nesting activities. The Montana Bald Eagle Guidelines would be used for timing and distance restrictions. Mature cottonwood trees, used as bald eagle hunting/feeding perches, are found along both crossings of the Gallatin River but should not be affected by the Proposed Action. Figure 4-1 below indicates areas near the Gallatin River where bald eagles have been known to perch on the existing 50kV transmission line (Tom Ring, pers. comm., March, 2004). Specifically, the observations were along the center portion of Figure 4-1 and southeast of the county road crossing of the interstate highway.

Figure 4-1 Aerial photo of Gallatin River crossing vicinity.

Minimizing cottonwood removal in riparian forests would help reduce potential impacts to bald eagle hunting/feeding perches. Bald eagles may use the H-frame towers between the Three Rivers and Trident substations as perching locations, possibly creating a beneficial effect for the species. The extent of this use is difficult to predict, but could lead to increased foraging opportunities for the species. Impacts are thus considered very low, and no further mitigation is required. Specifications of the Avian Power Line Interaction Committee (1996) will be observed to protect raptors from electrocution when perching.

Transmission line strikes by eagles, while possible, are not considered an important cause of bald eagle mortality (Faanes 1987, APLIC 1994). Typically, raptors are highly maneuverable, soar relatively slowly, and do not fly in large flocks. Because of these flight characteristics, raptors are seldom involved in transmission line collisions (APLIC 1994). Collisions occur most often where transmission lines intercept areas where birds concentrate, such as migratory flyways, feeding areas, and nesting/roosting sites (Savereno et al. 1996). Hence, the area of greatest transmission line strike concern for the Project would be the crossings of the Gallatin and Missouri Rivers and at winter concentration areas in the vicinity of Camp Creek.

Due to the configuration of the 161kV transmission line proposed for the Project, no avian electrocution impacts are expected. Avian electrocutions on high voltage transmission lines, even for large birds such as bald eagles, are extremely rare and are not thought to be a key mortality factor (APLIC, 1996). Raptor electrocutions are very rare on transmission lines larger than 69kV.

Any new structures associated with the proposed Project would conform to APLIC 1996 recommendations and would not be expected to create an avian electrocution hazard.

Other Wildlife

Potential impacts to other wildlife in the project area including white-tailed deer, coyote, raccoon, skunk, blue heron, osprey and other small game species associated with construction activity could include disturbance and/or loss of native vegetation or habitat, and/or loss or displacement of individuals. In areas where potential construction impacts to wildlife are possible, measures to reduce impacts would be expected to be effective in reducing or eliminating those potential impacts.

Low impacts to wildlife resources may result from actions that cause a short-term (during construction) reduction in the quantity or quality of habitat critical to the survival of local wildlife populations such as causing individuals to temporarily relocate.

Because the proposed Project is not expected to result in the conversion of large areas of shrub/grassland or riparian habitat, permanent impacts to wildlife are anticipated to be low. A very small amount of habitat would be permanently converted to proposed Project facilities (i.e., pole locations), resulting in an insignificant amount of habitat loss. The proposed Project would not result in any long-term impacts as transmission line corridors are generally not avoided by big game species (Goodwin 1975, Thompson 1977).

Neotropical Birds

Potential habitat for neotropical birds exists throughout the study corridor primarily in the riparian corridors. Measures to reduce impacts, including but not limited to siting to minimize crossing riparian areas where possible given other constraints, line marking in selected riparian areas to reduce collision hazards, and minimizing the amount of riparian vegetation removed would help reduce potential impact to neotropical birds.

Migratory Birds and Waterfowl

Potential impacts to waterfowl associated with construction activity could include disturbance and/or loss of habitat, and/or loss or displacement of individuals. Construction near wetlands during the primary nesting season (April 15-August 1) has the potential to disturb or displace nesting waterfowl should they be present. However, the wetland areas near Central Park (mileposts 12.8 through 15.0) where construction would take place are already subject to continual disturbance associated with traffic on Interstate 90 (I-90), frontage road and railroad. It is possible that construction activities may add to the existing disturbance enough that it would cause waterfowl that would have nested in this location to move to another location.

As discussed in the Wetland and Water Resources section of this report, a small amount of fill may be required in a low quality borrow pit wetland found between mileposts 13.0 and 13.2. This fill may result in the loss of a small amount of waterfowl habitat.

The largest threat to migratory birds from operation of the proposed Project is in-flight collisions with electrical transmission lines. Although it is impossible to avoid this potential impact from overhead transmission lines, impacts would be minimized through the incorporation of measures

to reduce impacts including marking of the ground wire and conductors with bird flight diverters at river crossings and near Camp Creek west of Central Park (refer to Figure 4-1 for areas that would be marked with avian crossing markers). Furthermore, NWE proposes a horizontal conductor configuration at river crossings. The larger diameter conductors used in higher voltage transmission lines also increases the visibility and reduces the potential for avian collision.

One particular area for this concern was identified by the DEQ during project scoping. The area near Central Park (mileposts 13.0 through 15.0) contains several spring creeks including Camp Creek, irrigation ditches, the Gallatin River, and two large ponds south of I-90. Waterfowl frequent this area moving from open water to adjacent fields of dry and irrigated farmland. A field trip was made to the area with DEQ and NWE biologists to identify areas where additional measures to reduce impacts (marking the line) would be required to further reduce potential impacts from avian collisions. Areas where additional marking would be installed are identified above in Figure 4-1 in order to avoid violations of the federal Migratory Bird Treaty Act.

Fish

No special status fish species are known to occur in the study corridor.

No Action Alternative

Under the No Action Alternative, the proposed Project would not be built. There would be no alteration to the wildlife and fisheries resources within the study corridor. However, the existing 50kV transmission lines would still be in place and maintenance would continue. As well, the rebuild of the Trident-Belgrade 50kV transmission line would also occur.

Impact Significance

Based on the foregoing discussion, there would be no significant impacts to federally or state-listed species or their habitats, to non-listed but highly sensitive or vulnerable species, or to high quality or undisturbed biological communities or habitats. Non-significant wildlife impacts would occur including impacts that would not substantially adversely change or stress the resource on a long-term basis and impacts to a wildlife resource that are already disturbed or lack regional importance. Short-term impacts to wildlife and wildlife habitats are expected due to construction, but these impacts would be limited in geographic area.

4.2.2 Vegetation

Introduction

This section describes the types of impacts that could occur to botanical resources within the study corridor from construction and operation of the proposed Project.

Direct impacts to botanical resources would include vegetation clearing along the transmission line and access roads and ground disturbance at pole sites and along access roads. Other direct impacts could include loss or displacement of individuals and habitat features of sensitive plant species.

Indirect impacts to botanical resources could include increased risk for noxious weeds to invade the area. Impacts would be minimized or eliminated by applying the measures to reduce impacts committed to by NWE as part of the proposed Project description.

Impact Results

Special Status Species

Although one federally listed Threatened species, Ute ladies' tresses, has the potential to occur in the study corridor, a review of the MNHP database did not reveal known locations of this species. High potential habitat for Utes ladies' tresses, derived from soils data determined by the MNHP to have a high correlation with this species, does occur within the study corridor in undisturbed habitat. However, no high potential habitat was identified within the actual area of impact of the proposed Project. The limited wetland habitat within the area of impact has been previously disturbed from past activities associated with road and railroad construction. It is doubtful that any impact to this species would occur. This area, while sensitive environmentally, would not have additional long-term impacts from the Proposed Action because the new line would be a rebuild of the existing 50kV transmission line, and there would be minor incremental impacts as compared to a new line through a previously undisturbed area.

Five state listed Sensitive plants may have the potential to occur in the study corridor. A review of the MNHP database revealed historical records of occurrence for mealy primrose, annual Indian paintbrush, small dropseed, dwarf purple monkeyflower, and slender wedgegrass. Actual locations of occurrence for these species are vague because the information is general or limited, and the last observation dates are very old (mealy primrose-1959, annual Indian paintbrush-1899, small dropseed-1941, dwarf purple monkeyflower-1894, and slender wedgegrass-1905). For this reason, the location data provided by the MNHP include a larger area of uncertainty than is justified by location descriptions and the species' habitat requirements, making it difficult to accurately identify whether the species actually was located within the study corridor. Therefore, habitat descriptions are given below.

Mealy primrose in Montana appears to be restricted to wet meadow habitats with relatively stable water tables. Associated streams have a fairly constant water flow; i.e., permanent flows with little flooding in spring. Soils remain moist to saturated throughout the growing season, but there is little or no inundation. Mealy primrose is often found growing on the sides of hummocks where the density of overtopping vegetation is reduced. Hummock habitats are moist without being wet and are more open than wetter microhabitats dominated by sedges and rushes (MNHP 2004).

Annual Indian paintbrush occurs in moist alkaline meadows in the valley zone (MNHP 2004). It is listed by the USFWS as an obligate wetland species.

Small dropseed is found in grasslands in the valleys and on the plains; both natural and disturbed habitats are represented in Montana (MNHP 2004).

Dwarf purple monkeyflower occurs in dry, open, often gravelly or sandy slopes in the valleys and foothills (MNHP 2004).

Slender wedgegrass prefers wet areas in the valleys or foothills (MNHP 2004).

Potential habitat for all of the above listed state Sensitive plant species may occur in the study corridor. However, implementation of Project measures to reduce impacts listed below would be effective in reducing or eliminating potential impacts to sensitive plant species.

- Utilizing existing access roads where possible
- Limiting access to overland driving where feasible
- To minimize the amount of sensitive features disturbed in designated areas, poles would be placed so as to avoid sensitive features such as, but not limited to, riparian areas and watercourses and/or to allow conductors to clearly span the features, within limits of standard pole design

Riparian Woodlands/Cottonwoods

Riparian forests are considered a high value and sensitive habitat type by MNHP ecologists (Jones, pers. Comm.). MNHP staff indicated that it is important to (a) minimize new disturbance in riparian forests, (b) keep disturbance to previously disturbed areas, and (c) keep structures out of active floodways.

The proposed Project would utilize a previously disturbed corridor for most of its length, including areas where it crosses riparian areas. No riparian forest (i.e. cottonwoods) would be impacted by the proposed project with the exception of the proposed Gallatin River crossing at milepost 13.0 (see Map 2: Water and Wetland Resources-Appendix D). In this location a small amount (less than 20) relatively small cottonwoods approximately 20-50 feet tall would require removal to facilitate the crossing and maintain safe clearance for the conductors. The proposed crossing lies in the area between the frontage road/railroad grade and Interstate 90. Although the riparian corridor is fairly broad north and south of this crossing, it is quite narrow in this location due to past and on-going disturbance associated with the frontage road, railroad, and I-90. Because this riparian corridor is already fragmented, the removal of small amounts of cottonwoods would have a minimal affect on this habitat.

Noxious Weeds

The proposed Project would include clearing of land capable of supporting native vegetation. Areas of disturbed soil provide an optimal location for noxious weed establishment and subsequent invasion.

Noxious weeds can also spread through an area if care isn't taken to prevent weed infestations. Vehicles, for example, may transport seeds of noxious weeds to the study corridor and could give these weeds a competitive edge over native vegetation by depositing weed seeds where they would not occur naturally. However, because the proposed Project would implement a noxious weed control plan, it is not expected that noxious weeds would increase compared to the existing condition.

Prior to construction, NWE would prepare a revegetation plan as required by state statutes pertaining to weed control (7-22-2152, MCA). The plan would specify disturbance types and their appropriate revegetation techniques to be applied for all proposed Project work areas, access roads and the re-use of sidecast materials and topsoils. Techniques could include reseeding native or other acceptable vegetation species with certified weed-free seed. NWE

would develop a noxious weed control plan in consultation with the DNRC and the weed control board to minimize the effects of noxious weeds due to proposed Project activities. The plan would address any required cleaning of construction vehicles to minimize spread of weeds. In addition, many of the measures to reduce impacts common to several resources that would reduce overall disturbance would be effective at preventing the establishment or spread of noxious weeds. Weeds will be monitored and controlled for a period of five years. At the end of the five years, weed populations will be surveyed and documented, and if at that time it is determined that additional monitoring and control will be necessary, the county weed control district will be consulted with to determine a plan of action.

No Action Alternative

Under the No Action Alternative, the proposed Project would not be built. There would be no alteration to the vegetative resources within the study corridor. However, the existing 50kV transmission lines would still be in place and maintenance would continue. The rebuild of the Trident-Belgrade 50kV transmission line would also occur.

Impact Significance

Based on the foregoing discussion, significant impacts to botanical species would not occur because there would be no substantial disturbance to or loss of federally or state listed plant species or their habitats, to highly sensitive or vulnerable plant species, or to regionally important undisturbed vegetation communities. Non-significant impacts to plant species would occur. Examples of these non-significant impacts include effects that do not result in adverse change or long-term stress or impacts to plant species that are already disturbed or lack importance to biological diversity and productivity.

4.2.3 Water and Wetland Resources

Introduction

Construction, operation and maintenance of transmission line facilities can create temporary and permanent impacts to Water and Wetland resources.

Potential impacts to Water and Wetland resources could result from accelerated erosion and sedimentation from the construction and maintenance activities on or adjacent to streams or wetlands. Other potential impacts include water quality degradation, and decreased wetland size, function, or value. In areas where potential impacts to water resources and wetlands are possible, measures to reduce impacts committed to by NWE would be effective in reducing or eliminating those potential impacts.

Refer to Map 2: Water and Wetland Resources (Appendix D), for specific locations of water resources within the study corridor.

Impact Results

A small amount of accelerated soil erosion, subsequent downstream sedimentation and potentially reduced surface water quality could occur during construction of the proposed Project. The transmission line and some access roads would cross wetlands in isolated situations. Ground disturbing activities associated with structure placement (work areas, foundations) in close proximity to water resources and wetlands have the potential to introduce sediment into these water bodies. Erosion and sediment control measures would meet requirements for the Clean Water Act and roads would be built at right angles to the streams and washes to the extent practicable. Culverts would be installed where needed. All construction and maintenance activities would be conducted in a manner that would minimize disturbance to drainage channels, and streambanks (e.g., poles). Impacts from construction activities would be localized and would be short term.

Several perennial, intermittent and ephemeral streams, as well as irrigation ditches, are located in the study corridor (see Map 2: Water and Wetland Resources-Appendix D). However, the nature of transmission lines allows these features to be spanned. No structures would be placed in streams or irrigation ditches.

Potential wetland impacts could occur to the low quality borrow pit wetland found between mileposts 13.0 and 13.2 as well as near several spring creeks including Camp Creek (milepost 13.0 to milepost 15.0). At this location it may be necessary to construct a spur road and place a structure within the wetland. Although a small amount of fill may be placed within the wetland, general conditions and stipulations made part of the US Army Corps of Engineers Nationwide Permit #12 would be followed to ensure that potential impacts are kept to a minimum. A discharge permit may also be required from DEQ prior to filling a wetland.

The proposed transmission line alignment would cross designated 100-year floodplains in four locations. At milepost 13.0, the proposed alignment would cross approximately 300 feet of 100-year floodplain associated with the Gallatin River. This floodplain would likely be spanned and no impact would result. The proposed alignment would cross the Gallatin River and its floodplain again at milepost 20.2. This crossing would begin and end on high bluffs above the river and no floodplain would be impacted because the riparian corridor would be spanned. One crossing of the Missouri River at milepost 26.9 would also cross designated 100-year floodplain. However, the river is channelized in this location and the floodplain is limited to within the banks of the river. No floodplain would be impacted. There is a 100-year floodplain associated with Baker Creek near milepost 14.5 which may be impacted by the proposed Project. Approximately 1000 feet of floodplain is located in the transmission line alignment between the Montana Rail Link railroad grade and Interstate 90. Should final design indicate that any structures be placed within this floodplain, a floodplain permit application would be submitted for approval prior to construction taking place.

Rehabilitating the vegetation cover, spanning sensitive features, and crossing streams using existing crossings would minimize these impacts through the application of measures to reduce impacts and Best Management Practices (BMPs). Erosion control BMPs including sediment traps and/or filter barriers would be installed as needed and disturbed areas would be revegetated. These measures would be required as part of the Storm Water Pollution Prevention Plan (SWPPP), which would be prepared to meet requirements of the Clean Water Act before

construction begins. The potential for long-term impacts would exist from vehicular traffic on access roads, but closing the roads to public access would minimize these impacts.

The Gallatin River is the only 303(d)-listed stream that is located within the study corridor. Impacts to Gallatin River would be minimized by the implementation of the measures to reduce impacts discussed earlier and would not be expected to further degrade water quality standards. Sedimentation and erosion control devices would be employed as needed to control and contain runoff.

Management practices described above and in Chapter 2 regarding water-crossing methods, soil stabilization and restoration would help eliminate or reduce potential impacts to water resources. No further mitigation is recommended. Proper permits for activities in streams or wetlands would be obtained from local, state and federal agencies and requirements in the permits would be followed to ensure protection of water quality and aquatics. Activities within floodplains require a Floodplain Development Permit (Montana Floodplain and Floodway Management Act). If final design indicates that any structures would be placed in a floodplain, a Floodplain Development Permit would be obtained. The construction, placement, or modification of a structure or improvements in, over, below, or above a navigable stream (Gallatin and Missouri Rivers) requires a Montana Land-Use license or Easement from the MDNRC. Furthermore, a COE 404 permit would likely be required.

No Action Alternative

Under the No Action Alternative, the proposed Project would not be built. There would be no alteration to the wetland and water resources within the study corridor. However, the existing 50kV transmission lines would still be in place and maintenance would continue. As well, the rebuild of the Trident-Belgrade 50kV transmission line would also occur.

Impact Significance

Based on the foregoing discussion, DEQ concludes that no significant water resources or wetland impacts would result from this action. The Project would not permanently decrease the capacity of drainages, alter drainage patterns, cause a detrimental increase in site erosion, increase the potential for substantial flood damage, or cause a substantial degradation of surface or ground water quality for beneficial uses.

4.2.4 Air Quality

Introduction

The following section discusses potential impacts from the construction of the proposed Project to air quality in the general area of the proposed Project.

Impact Results

Dust Emissions and Control

During the construction period, fugitive dust would likely arise from travel through areas not containing roads, heavy construction activities, and the carryout of mud and dirt from construction areas to paved roadways. Dust emissions generated from construction equipment would be mitigated through the application of water as necessary to maintain dust control. Montana Route 85 and I-90, which would provide some access to the ROW, would be cleaned as necessary to remove accumulated dirt. The project would employ best engineering practices and utilize all reasonable precautions in the control of airborne particulate matter.

Following the construction and any subsequent reclamation activities, emissions of fugitive dust are expected to be negligible and limited to infrequent vehicle traffic necessary to conduct equipment inspections and necessary maintenance activities. The proposed alignment would not be located within the City of Belgrade and would be located within an existing ROW through Manhattan so as not to affect the attainment area. No adverse affects are expected.

Greenhouse Gas Estimates and Carbon Monoxide

Greenhouse gas emissions such as (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) during construction of the proposed transmission line are expected to be negligible and limited to exhaust from construction equipment. Some exhaust from vehicles would also be expected during operation and maintenance visits to the transmission line. As there exists no monitoring evidence of a CO problem in Gallatin County it is not expected that the Project would have an indirect significant impact. CO is a gas that does not have a direct global warming effect but indirectly affects terrestrial and/or solar radiation absorption by influencing the formation or destruction of other greenhouse gases, including tropospheric and stratospheric ozone. These gases include carbon monoxide (CO), oxides of nitrogen (NO_x), and non-methane volatile organic compounds (NMVOCs). As the duration of construction is short, no greenhouse gas effects are foreseen either directly or indirectly. Measures to reduce impacts, described in Chapter 2, would be utilized to reduce or eliminate potential impacts to air quality.

No Action Alternative

Under the No Action Alternative, the proposed Project would not be built. There would be no soil-disturbing activities to create dust or exhaust and therefore, no impact to air quality would occur. However, the existing 50kV transmission lines would still be in place and maintenance would continue. As well, the rebuild of the Trident-Belgrade 50kV transmission line would also occur.

Impact Significance

Based on the foregoing discussion, DEQ concludes that no significant air quality impacts would result from this action.

4.2.5 Geology and Geohazards

Introduction

The proposed construction, operation and maintenance activities for the Project were reviewed to assess impacts to geology and impacts from geohazards to the Project. A professional determination was made of the potential impacts based on the topography, geologic setting, and location of sensitive features.

Impact Results

Construction of the Project would have a low impact on geologic resources along the alignment. Minor displacement of earth materials would occur due to upgrading and/or extending the existing access roads, and new tower and substation construction areas. Small quantities of earth materials would be irretrievably lost due to the construction and operation activities. These resources are not considered unique or irreplaceable in that there are abundant quantities of like materials in the vicinity.

A cement manufacturing plant is located on the east side of the Missouri River. The limestone resource for the manufacturing plant underlies a portion of the existing transmission line ROW. The proposed action would be constructed within the existing ROW south of the current mining operation, and no acquisition of additional land in the vicinity of the limestone resource is planned. Construction of the proposed Project would not diminish the volume of limestone currently available for the cement plant.

Two geohazards are identified in connection with the proposed Project: seismicity and unstable slopes and foundation conditions. Groundshaking and liquefaction related to a nearby seismic event may damage the structures and transmission lines. Disturbance of the fine grained shale units exposed in the upland areas north of the Gallatin River may initiate mass wasting processes. The mass wasting may impact foundation integrity and roadway stability.

Measures to Reduce Impacts

No measures are necessary to mitigate the impacts to geologic resources. The potential for geohazard impacts during and after construction can be minimized during geotechnical investigations as part of the transmission line design.

No Action Alternative

Under the No Action Alternative, the proposed Project would not be built. There would be no impact to geologic resources or potential geohazard issues. However, the existing 50kV transmission lines would still be in place and maintenance would continue. As well, the rebuild of the Trident-Belgrade 50kV transmission line would also occur.

Impact Significance

DEQ concludes that no significant geology or geohazard impacts would result from this action based on the foregoing discussion.

4.2.6 Soils

Introduction

The primary concern regarding soil resources is to avoid or minimize potential impacts related to erosion from construction activities and to minimize compaction and relocation. Relocation is defined here as the mixing of soil horizons during construction; that is, topsoil may be moved to lower horizons, etc. Impacts were evaluated by milepost along the proposed alignment. Also discussed are proposed measures that would reduce the impacts to soils. Study corridor soil resources are described in detail in Chapter 3.

Impacts were assessed considering probable ground disturbance based on information in Section 2.3, Alternatives Evaluated in Detail.

Impact Results

All detailed soil map units crossed by the proposed centerline would be subject to some type and level of disturbance. Soil surface disturbance, compaction, and relocation would occur to varying degrees. Overhead transmission line construction requires excavation, grading, and possibly soil stockpiling. These disturbances would likely result in some increase to wind and water erosion rates and compaction levels, and result in the relocation of some soil resources. Short-term and/or long-term impacts are discussed below.

Accelerated Soil Erosion

Construction activities that remove vegetation and cause soil surface disturbance would likely result in increased soil erosion rates. Erosion rates would depend on site-specific characteristics including soil type, slope length and steepness, applied measures to reduce impacts, and climatic conditions. Water erosion would generally be associated with localized precipitation events. Snowmelt would likely not contribute significantly to potential water erosion. The potential for wind erosion would generally be higher, though not considerably so, during the summer, autumn and winter months. Erosion could result in some loss of productive potential. Soil erosion impacts would be short term in duration with the possible exception of localized severe erosion resulting from a significant precipitation event.

Detailed soil mapping units within the study corridor have varying potentials for wind and water erosion. The majority of detailed soil mapping units have moderate to severe wind and slight to moderate water erosion potentials. Soils with moderate wind or water erosion potential occur between mileposts 0.0 to 2.3, 6.9 to 11.6, 12.8 to 14.9, 20.1 to 20.3, and 27.3 to 28.0 for a total of 10.0 miles. Soils with severe wind or water erosion potential occur between mileposts 11.6 to

12.8, 14.9 to 16.3, 17.2 to 20.1, 20.3 to 26.7, 26.8 to 27.3, and 28.0 to 28.4 for a total of 12.8 miles.

The proposed centerline would pass through developed areas between mileposts 2.3 to 6.3 (road prism of Jackrabbit Lane), 6.3 to 6.9 (urban development associated with Belgrade), and 16.3 to 17.2 (urban development associated with Manhattan) for a total of 5.5 miles. Soil resources in these areas have essentially been eliminated or are severely disturbed by previous development activities. The Missouri River crossing would occur between milepost 26.9 to 27.0.

Soil Compaction

Soil compaction could occur as a result of construction activities associated with the Project. Heavy construction equipment use can result in soil compaction. Rubber-tired vehicles generally compact soils more than tracked vehicles. The extent of compaction would depend in large part on soil moisture content and the physical characteristics of a particular affected soil type. Compaction tends to be the most severe when soils are moist to wet. Very dry and very wet soils generally would not compact as severely. Duration of the impact would depend to a large degree on compaction severity. Compaction impacts would generally be short term in duration, but would have the potential to affect soil resources in the long term.

Rutting

Soil rutting may occur. Rutting is typically a concern when vehicle or construction equipment travel occurs during wet conditions. Rutting can restrict the movement of water through and across soil thus altering soil / water dynamics. Tracked or rubber tired vehicles can cause rutting. Standard rubber tired vehicles typically have more potential for rutting than tracked or flotation tire equipped vehicles. Duration of the impact would depend in large part on the severity of the rutting and the effectiveness of restoration activities following construction.

Soil Relocation

Soil relocation is typically caused by project related construction activities. Soil resources may be directly displaced by construction equipment, although these impacts are considered negligible. Construction activities that could cause relocation of soil horizons, including road improvements, new access road construction, and transmission tower foundation placement would result in moving soil resources by construction equipment. These effects would not be noticeable in areas of overland construction (i.e., no new access roads). Topsoil stripping by casting aside the topsoil when grading roadway would mitigate any potential concerns. Sidecase soils would be replaced following construction.

Measures to Reduce Impacts

Measures are proposed to avoid or minimize project related impacts to soil resources. Applying measures to reduce impacts would effectively reduce soil related impacts resulting from the Proposed Action. Measures identified in Section 2.3.2, Protection of Private Property and Resources, would be applied to appropriate areas to reduce impacts to soil resources. Additional measures recommended include sidecasting topsoil during access road construction, then spreading the topsoil over the bladed surface during rehabilitation.

No Action Alternative

Under the No Action Alternative, the proposed Project would not be built. There would be no impact to soil resources. However, the existing 50kV transmission lines would still be in place and maintenance would continue. As well, the rebuild of the Trident-Belgrade 50kV transmission line would also occur.

Impact Significance

No significant soil erosion impacts would result from this action given the measures proposed by NWE to reduce impacts.

4.2.7 Visual Resources

Introduction

Visual impacts resulting from the Project would be direct and both short (temporary) and long-term (life of the Project). Short-term impacts would result from views of construction activities and equipment along the proposed ROW, as well as views of the staging areas from Interstate 90 and residential viewers located near the project in unincorporated Gallatin County. Long-term impacts would result from the visual contrasts (i.e., visibility of the poles and conductors) remaining for the life of the Project that would be seen by sensitive viewers.

Visibility of Project facilities to sensitive viewers were organized into three categories. Foreground visibility is from 0 to 500 feet, middle ground visibility is from 500 to 1000 feet, and background visibility is from 1000 to 1500 feet (see Map 3: Visual Resources-Appendix D).

Impact Results

Visual Contrast

Changes to the landscape resulting from the Project are referred to as contrast. Contrasts are described as vegetation, landform, or structure contrast. Contrasts occur from changes in line, form, color, and/or texture to the existing landscape described in Chapter 3.

The primary long-term contrast would result from the additional height of the new poles and the presence of poles where there were none previously. The existing 50kV transmission line poles range in height between 45’-55’ tall. The proposed structures would range in height between 60’-90’ tall depending upon the terrain. The typical structure would be 65’ tall, refer to Figure 2-1 located in Chapter 2.

The secondary long-term contrast would result from the removal of Cottonwood trees near the Gallatin River crossing. This change in the composition of riparian vegetation would be noticeable to dispersed recreationists along the river. Highway motorists traveling I-90 would also notice the change in vegetation composition at the Gallatin River crossing. However, due to the high-speed travel upon I-90, this change would only be noticeable for two to three seconds when crossing the Gallatin River.

Short-term landform contrasts of grading and pole site excavation would also occur.

Impacts to Sensitive Viewers

Impacts occur when a sensitive viewer notices the contrasts resulting from the Project. Refer to the Viewer Impact Matrix found in the Impacts to Visual Resources Table (Appendix A).

Residences

Residential viewers located between milepost 7.7 to 8.7 would have views of a strong to moderate contrast in the foreground distance zone. This would result in a moderate impact due to the high viewer sensitivity, foreground distance zone and strong contrast that would be visible as a result of the Project. Strong visual contrasts would result here because no existing visible transmission facilities occur along this portion of the route.

Residential viewers from milepost 8.7 to 11.5 would have foreground views of the Project that would consist of a moderate to weak visual contrast. This moderate to weak visual contrast would result from the Project replacement of the existing 50kV transmission line. Residential viewers in this area are familiar with the existing transmission line being part of their view shed. Replacing the line in this area would result in a discernable change but would not cause a change that would be greatly out of scale or proportion to the existing facility.

Visual impacts would be low for viewers located near other portions of the Project that would have foreground views of a weak visual contrast. Approximately 35 residences are located within the foreground distance zone along Jackrabbit Lane from milepost 2.0 to milepost 6.0. Approximately 122 residences, around the Manhattan area, occur within the foreground distance zone from milepost 16.0 to 18.0. Both residential areas would see a visible change (visual contrast) similar to those discussed from milepost 8.7 to milepost 11.5.

Parks and Recreation Areas

Primarily background views with some middle ground views occur from Missouri Headwaters State Park from milepost 26.2 to 26.6. The combination of the weak visual contrast seen in the background distance zone from a high sensitivity viewpoint would result in low visual impact. Foreground views from dispersed recreation areas occur from milepost 14.8 to 15.2 where dispersed recreationists visit the Gallatin River near the community of Central Park. The combination of the moderate visual contrast from the removal of cottonwood trees, seen within the foreground distance zone by a moderate sensitivity viewpoint would result in moderate to low visual impact.

Foreground views from dispersed recreation areas also occur from milepost 20.1 to 20.7 where dispersed recreationists visit the Gallatin River where the existing 50kV transmission line crosses near Logan. Foreground views from dispersed recreation areas also occur from milepost 26.3 to 26.8 where dispersed recreationists visit the Missouri River near the Missouri Headwaters State Park. The combination of the weak visual contrast seen in the foreground distance zone by moderate sensitivity viewpoints would result in a low visual impact.

Travel Routes

Views from I-90 would consist of strong to moderate visual contrasts where the poles would not parallel an existing transmission line between mileposts 6.8 to 8.9. Combining the low visual sensitivity, foreground views, and the strong to moderate visual contrast would result in a moderate visual impact from milepost 6.8 to 8.9. Views from I-90 would result in a low visual impact due to the weak contrast that would occur from paralleling existing transmission line structures. Views from Montana Route 85 would also result in low visual impacts due to weak visual contrasts even in nearby views. Visual contrast is a measure of the change from existing conditions without regard for the views (refer to section above titled Visual Contrast).

Motorists driving upon I-90 in the area between Belgrade and Manhattan (milepost 9.0 to milepost 15.5) would see larger structures, the addition of another circuit, and closer proximity to the interstate highway. Existing panoramic views of the Bridger Mountains from I-90 would be modified as a result of the project. However, the existing panoramic view currently contains an existing 50kV transmission line in the view from the motorists. The new structures would be approximately 50 % larger than the existing 50kV structures but would not obstruct the panoramic views visible from this portion of I-90. The Bridger Mountains would still be dominantly visible behind and above the proposed project. The 50 % increase in structure height represents a moderate to weak visual contrast that would be seen from viewers with a moderate to low visual sensitivity resulting in a low visual impact between mileposts 9.0-15.5.

Views of the Project from Route S-286 would include a weak visual contrast seen within the foreground distance zone. Combined with moderate viewer sensitivity would result in a low visual impact from mileposts 26.0 to 27.0.

No-Action Alternative

Under the No Action Alternative, the proposed Project would not be built. There would be no additional land disturbing activities or the installation of a new transmission line. However, the existing 50kV transmission lines would still be in place and maintenance would continue. As well, the rebuild of the Trident-Belgrade 50kV transmission line would also occur.

Impact Significance

Based on the foregoing discussion, DEQ concludes that no significant visual impacts would result from this action. There would not be substantial adverse effects on a scenic vista, substantial degradation of the existing visual quality of the landscape, or a new source of substantial light or glare that would adversely affect day or nighttime views in the area. Moderate impacts would occur to residential viewers located between milepost 7.7 and milepost 8.7, along Jackrabbit Lane from milepost 2.0 to 6.0, and in the Manhattan area between milepost 16.0 and milepost 18.0 that would have views of a strong to moderate contrast in the foreground to middle ground, a high viewer sensitivity and a strong to moderate contrast.

4.2.8 Noise

Introduction

Audible Noise

Sound level impacts for noise sensitive areas in the study corridor are based on an A-weighting of sound intensities that best reflects the human ear's reduced sensitivity to low frequencies. These sound intensity levels correlate well with human perceptions of the annoying aspects of noise. Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (L_{eq}) or by the average day-night noise levels (L_{dn}).

Radio Noise

Radio Inference (RI) refers to interference primarily in the 535-1605 kHz frequency range (this includes AM band operational frequencies and amateur or ham operational frequencies) and television interference (TVI) refers to interference in the 54-88 MHz range. Both RI and TVI are components of what is referred to as Radio Noise (RN). RN is measured in decibels and is referenced to a signal input of 1 microvolt tuned to a certain measurement frequency (dB per microvolt/meter or dbμv/m). The RN level of the line at any particular location and measurement frequency varies based on many factors. The primary factors are weather conditions and time but in the case of this 161kV line, altitude (elevation of the ground surface where the line is located) is also an important factor. In terms of the variation with time, RN is described in statistical terms and is typically denoted as the percentage of the total time that the RN level is less than a certain level. For example, a RN level often referred to is the "50 percent fair weather level," meaning that the RN from the line can be expected to be less than this level for 50 percent of the total fair weather period. Corona and gap discharges are two potential sources of radio noise from the line. Corona discharges induce trains of short duration current pulses that propagate along the line conductors, away from the point of generation. Gap discharges result from electrical discharges between broken or poorly fitting hardware, such as insulators, clamps and brackets.

Impact Results

Transmission Line Audible Noise

Audible noise levels from the operation of the 161kV transmission line is generally below 50 dBA in foul weather. In fair weather, the 161kV line would result in a maximum calculated L_{50} (noise that occurs 50 % of the time above or below this level) noise level of 23 dBA at a distance of 50 feet. Rainy or foul weather could increase the maximum calculated L_{50} noise level to 48 dBA at the edge of the ROW. Based on frequent windy conditions and other ambient noise such as from auto traffic adjacent to the line, the noise levels from the line, even in rainy conditions (i.e. masks the line noise), would be barely perceptible to sensitive receptors. In comparison, the foul weather audible noise level from the existing, single circuit 50kV line is a maximum of about 20 dBA at a distance of 50 feet.

Substation Audible Noise

Sources of audible noise within a substation include equipment such as transformers, reactors, voltage regulators, circuit breakers and other intermittent noise generators. Among these sources, transformers and reactors have the greatest potential for producing noise. Reactors are similar to a transformer in terms of audible noise. The broadband sound from fans, pumps and coolers has the same character as ambient sound and tends to blend in with the ambient noise. In the substation, the electrical equipment (as identified above) can be classified as point noise sources. For point sources, approximately a 6 dBA reduction in noise can be obtained with each doubling of the distance between the source and the point of measurement. This is equivalent to a decrease of 20 dBA for each increase in distance from the source by a factor of ten.

The sound levels for transformers are primarily a function of MVA ratings and the BIL (Basic Insulation Level). Based on the expected 75 percent rating of a 161kV transformer bank and data from previous sound measurements of other 161kV transformer banks, the projected sound level of these banks is 60 dBA. In the substation there is other equipment that would produce lower levels of noise. The calculated transformer audible noise levels decrease by approximately 15 dBA at the substation fence line. This occurs a distance of approximately 250 feet from the transformers resulting in a noise level of approximately 45 dBA. One residence is located within 250 feet of the proposed substation site located on the east side of Jackrabbit Lane, approximately three miles south of Belgrade. No residences are located within 250 feet of the existing Jackrabbit and Three Rivers Substations.

Construction Audible Noise

On-site construction noise would occur primarily from construction equipment (e.g., dozers, backhoes, cranes). Anticipated noise levels from this equipment would range from 70 dBA to 100 dBA at a distance of approximately 50 feet. It should be noted that noise levels are calculated based on the assumption that noise from a localized source is reduced by approximately 6 dBA with each doubling of distance from the source of noise. Direct noise impacts would result from construction activities occurring adjacent to sensitive receptors such as houses and recreation areas. However, this noise would be short term, occurring mostly during daylight hours. Construction activities would move along the 29-mile transmission line route and would not result in extended construction in any one area.

Radio and Television Interference

Corona and gap discharges are two potential sources of radio noise from the proposed 161kV line. Corona discharges induce trains of short duration current pulses that propagate along the line conductors, away from the point of generation. Gap discharges result from electrical discharges between broken or poorly fitting hardware, such as insulators, clamps and brackets.

For transmission lines with normal spacings and right-of-ways, a fair weather RI level of about 40 dBμV/m (100μV/m) at a lateral distance of 100 feet from the outermost phase has been established as a guideline for identifying a design criteria for a RN limit (IEEE Standard 430-1991). The worst-case fair weather RI at 100 feet from the outermost conductor is approximately 27 dBμV/m.

It has been estimated that more than 90 % of power line sources that cause radio and television interference are due to gap discharges. These gap discharges can be found and eliminated when required to prevent interference. The U.S. electric power companies have been able to operate quite well under the present Federal Communications Commission (FCC) rule because harmful interference can generally be eliminated. Very few of the interference complaints that power companies in the U.S. receive are due to corona. In the few cases where there have been problems, power companies have paid for the installation of special equipment to improve the signal-to-noise ratio (SNR) at the complainant's receiver. In some cases, problems are solved by hooking up the complainant's TV to cable or to satellite dishes (IEEE Line Design Working Group of the Radio Noise Subcommittee 1971). Properly designed transmission lines can greatly reduce the effects of corona. In addition, corona is primarily a concern for transmission lines operating at 345kV and higher. The Project would operate at 161kV and 50kV. The computed RI values are well bellow recommended guidelines.

According to the Federal Communications Commission (FCC) rules and regulations[3], power transmission systems fall into the category of "incidental radiation device" which is defined as: "a device that radiates radio frequency energy during the course of it's operation although the device is not intentionally designed to generate radio frequency energy." The operating requirements for such devices are: "An incidental radiation device shall be operated so that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference." Northwestern Energy is required by FCC Title 47 to correct the power transmission system to eliminate harmful radio and television frequency interference.

FCC requires that interference to base receivers from base or fixed transmitters should attempt to be resolved by technical means or operating arrangements. In terms of interference to mobile receivers from mobile transmitters, no protection is required. In terms of interference to base receivers from mobile transmitters, no protection is required.

No-Action Alternative

Under the No Action Alternative, the proposed Project would not be built. There would be no new noise impacts from the new transmission line. However, the existing 50kV transmission lines would still be in place and maintenance would continue. As well, the rebuild of the Trident-Belgrade 50kV transmission line would also occur.

Impact Significance

Impacts from noise would be considered significant if adopted local standards, noise element, or ordinance would be exceeded, the Project would increase the ambient noise level above ordinance-specified limits for the land use zoning, a permanent increase of 10 dB in noise levels above ambient levels from the Project at sensitive receptors (e.g., residences). Based on the

[3] The FCC rules and regulations are codified in Title 47 of the Code of Federal Regulations. FCC Title 47 CFR Part 15.5 and 15.13, 10-1-03 Edition, references interference from power transmission systems.

foregoing discussion, DEQ concludes that no significant noise impacts would result from this action.

4.3 HUMAN ENVIRONMENT

4.3.1 Land Use

Introduction

Construction, operation and maintenance of a new transmission line typically changes some land within the study corridor to permanent pole sites and access roads. However, for most of the length of the Proposed Route, the existing land use is transmission line/railroad ROW and the Proposed Action would not change this. Potential impacts to land uses were assessed for the inventoried land use categories described in Chapter 3. The various types of land use impacts that could occur were defined and impact locations were identified.

Impact Results

Existing Land Use

Developing staging areas, placement of poles, improving access roads or building new access roads would take place on vacant land and would not displace existing uses. Impacts to existing land use include the following:

- Dust, noise, and construction-related traffic impacts near residential and commercial areas. Further discussion of these impacts and the measures that would be taken to mitigate them, can be found in Section 4.2.4 Air Quality and Section 4.2.8 Noise. These impacts on land use would be considered low because construction-related effects would be temporary and measures to reduce impacts would be implemented as part of the construction to minimize effects on adjacent land uses.
- Short-term and indirect disturbance to the rural or open space character of some areas. Because of the short duration of construction at any one location, these impacts would be considered low.
- Short-term and direct impacts to apiary sites. Prior to construction of the transmission line, coordination with beekeepers would occur to minimize potential environmental impacts, and to mitigate general disruption caused by the construction activities. Because of the short duration of construction at any one location, these impacts would be considered low.
- Short-term and direct ground disturbance/disruption of cropland, and pasture uses next to and within the transmission line ROW. The amount of agricultural land potentially affected (crossed) is described in the Impacts to Land Use Table (included in Appendix A). Impacts on agricultural areas during construction could include the loss of standing crops, loss of crop productivity, loss of topsoil, and soil compaction. Depending on

specific project activity, timing and duration, construction activities could disrupt a portion of the planting, growing, irrigation, and/or harvesting of produce. During operation of the transmission line, cropland and pastures would be allowed to revert to their previous use. Land used for transmission line construction could take row crops out of production usually for up to one growing season; hay fields and pastures may take approximately two years to return to previous production levels. These impacts would be considered low because of the short-term duration of construction activities and the small area of cropland affected. Only 0.2 miles or 11% of agricultural land crossed by the Proposed Route is not located in a utility ROW.

- Short –term and direct ground disturbance of livestock pasture and grazing area uses next to and within the transmission line ROW. In livestock pasture and grazing areas, temporary removal of fencing and gates to provide construction vehicle access could require restriction of livestock to other fenced areas and could temporarily reduce the amount of land available for grazing. Construction activities could also temporarily disrupt livestock access to supplementary feeding and watering stations. Pasture and grazing areas crossed by the transmission line would also experience small losses of available forage as vegetation is removed, and soil is disturbed and compacted by construction activities. No livestock mortalities, however, are expected as a direct result of construction. Due to the short duration of the construction disturbance, the construction activity along the transmission line is expected to have a low and temporary adverse impact on adjacent livestock grazing.
- Long-term and direct impacts (increased hazards) to aerial spraying around transmission poles and conductors. Prior to construction, NWE would file a Notice of Proposed Construction or Alteration form with the FAA (FAA Form 7460-1) if needed. The form would be sent to the manager of the FAA Regional Air Traffic Division Office having jurisdiction over the area where the planned construction would be located. NWE would install high-visibility devices if required by the FAA as a result of their review of that notice.

Planned Land Use

No master plan, growth policy or zoning regulation would preclude the siting of the transmission line. The Proposed Route would cross subdivisions (see Impacts to Land Use Table in Appendix A) resulting in a moderate impact. NWE would, to the extent feasible, coordinate transmission structure locations with the subdivision developers and local agencies to minimize the effects of the transmission structures or access roads on proposed or planned land uses.

Parks, Recreation and Preservation Areas

The Proposed Route would not cross developed park sites or recreational areas. Since most of the recreational activity that would be disturbed by the transmission line is dispersed (hunting, fishing and wildlife viewing), disturbance from the transmission line would be minor. Some recreational activities could be diverted during construction, but would resume once construction ended. The recreational experience of recreationists using adjacent properties during construction could also be affected (e.g. noise). Because of the short duration of construction at any one

location, these impacts would be low. Once construction is complete at any particular location, these impacts would cease to exist.

Property Value

Proposed transmission line projects often raise concerns about their potential effects on property values. In general, there are two types of property value impacts that may be experienced by property owners affected by a new transmission line. The first is a potential economic impact associated with the amount paid by a utility for a ROW easement. The second is the potential economic impact involving the future marketability of the property. Although somewhat interrelated, these two effects are discussed below.

Just compensation for a transmission line easement has been typically interpreted as the difference between the fair market price of the land with and without the encumbrance of the line. Economic impacts to landowners may occur if they are not compensated for the "highest and best use" of the affected parcel or if the effective "taking" is larger than the actual easement.

Potential impacts related to the marketability of a property include factors such as sale price, the amount of time required to sell, and the debt carried over this time.

A transmission line may either increase or decrease an individual's perception of a property's worth. This perception is indicative of how much one is willing to pay for the property (the fair market value).

The perceived value of a piece of property may increase if:

- A cleared ROW provides better access to interior lands or water.
- A cleared ROW creates an opening that enhances the area for certain wildlife.
- A cleared ROW provides open space that is used for gardening or recreation.
- Increased local electrical reliability enhances opportunities for development of commercial or industrial interests.
- In rural areas, especially in the vicinity of large wooded parcels, utility ROW may provide improved access for hunting, snowmobiling, or other recreational activities.
- White tailed deer and some other animals use forest openings for foraging and travel. In urban or suburban residential areas, lots on or adjacent to transmission line corridors are often sized larger than neighboring lots but similarly priced, allowing residents to benefit from the added buffer and space the ROW provides. Integrating the open space of the utility corridor into a neighborhood and developing it as usable space can also diminish or avoid adverse effects on property values.

Conversely, the perceived value of property may decrease in value because of:

- Concern or fear of possible health effects from electric or magnetic fields (refer to the Electric and Magnetic Fields section).
- The potential noise and visual unattractiveness of the transmission line (refer to the Visual Resource section).

- Potential interference with farming operations or foreclosure of present or future land uses.

Lastly, the presence of a transmission line may not affect some individuals' perceptions of a property's value at all. These people tend to view transmission lines as necessary infrastructure on the landscape, similar to roads, water towers, or antennae. They generally do not notice the transmission lines nor do they have strong feelings about them.

Appraisers, utility consultants, and university researchers have studied this issue since the 1950s. Studies have either been based on appraisal comparisons of like property proximate or not proximate to transmission lines, attitudinal studies of qualitative perceptions, or statistical analyses using statistical tools on data derived from appraisals and other field study methodologies (Kroll & Priestley, 1992). While the data from many of the studies reviewed are often inconclusive, some general points of agreement between the studies are:

- Overhead transmission lines have the potential to reduce the sale price of residential and agricultural property.
- The estimated reduction in sale price for single-family homes has ranged generally from 0 to 15 percent.
- Agricultural values are likely to decrease if the transmission line poles are in a location that inhibits farm operations.
- Other factors, including size of lot, square footage of a house, and neighborhood characteristics, have a much greater effect on sale prices than the presence of a transmission line.
- Positive impacts may also occur, where the ROW is attractively landscaped and/or developed for recreational use.
- Effects are most likely to occur to property crossed by or immediately next to the line, but some impacts have been measured at longer distances.
- Impacts may be greater for small properties than for larger properties.
- Impacts may be greatest immediately following construction of a new line (or a major increase in size in an older ROW), diminishing over time.

The report *Transmission Lines and Property Values: State of the Science* was recently published by the Electric Power Research Institute (EPRI) (EPRI 2003). The report indicated the following regarding their review of recent studies of the effects of transmission line on property values: cases of small decreases in property values associated with proximity to a transmission line, no changes in property values, and even increases in property values.

It is very difficult to make predictions about how a specific transmission line will affect the value of specific properties. Some short-term adverse impacts on property value and saleability may occur on an individual basis. However, these impacts are highly variable, individualized, and unpredictable. The Project is not expected to cause overall long-term adverse effects on property values along existing transmission ROW. Project impacts along with numerous general market factors should already be reflected in the market value of properties along the existing transmission ROW in the study corridor. Land needed for easements associated with the new

transmission line, or access roads would be appraised and landowners would be offered fair market value for these land rights.

Existing Easements on State Lands

The existing 50kV transmission line along Frank, Thorpe, and Amsterdam Roads would be abandoned with the Proposed Action. The existing lease on State Lands would be eliminated on these properties as a result.

Measures to Reduce Impacts

Measures identified in Section 2.3.2, Protection of Private Property and Resources, will be implemented to reduce or eliminate potential impacts to land use.

No-Action Alternative

Under the No Action Alternative, the proposed Project would not be built. No impacts would occur to land uses within the study corridor. However, the existing 50kV transmission lines would still be in place and maintenance would continue. The rebuild of the Trident-Belgrade 50kV transmission line would also occur.

Impact Significance

Based on the foregoing discussion, DEQ concludes that no significant land use impacts would result from this action.

4.3.2 Transportation

Introduction

Direct and indirect impacts could include increases in traffic, detours along some roads, and disrupted access to driveways and/or businesses along the Proposed Route. Construction and removal of transmission lines are not expected to cause major traffic delays or road closures. Minor traffic delays or interference with the highway system would most likely result from the proposed Project's construction. Transmission line construction techniques should not require temporary closure of main highways. Users of smaller roads may experience minor delays. NWE would work closely with state and county road departments, so that crossings are properly posted and detours provided where necessary.

Impact Results

The proposed Project would utilize public rights-of-way (roads, streets, or highways) in some locations. According to Montana Code Annotated 2003 69-4-101, use of public ROW for utility lines and facilities allows for this. This use is allowed where the location of such facilities does not endanger the public. Montana Department of Transportation utility pole crash statistics over a three-year period (from 2001 to 2003) indicated that there were 933 total crashes involving

utility poles (this includes telephone, light, and power poles). This accounted for 0.85 percent of the total crashes for these years. Forty seven percent (443) of the accidents involving utility poles took place in the city limits. Fifty seven percent (490) took place outside of the city limits. With new construction, utility poles are located outside the clear zone, an area off the edge of the traveled way available for safe use by errant vehicles. The State of Montana has over 69,000 miles of public roads (Jomini 2004). The Project would be moved from the current location of the 50kV transmission line between the railroad and highway and constructed between the Montana Rail Link railroad and Interstate 90 between the City of Belgrade and the Town of Manhattan.

As part of transmission line design, NWE will comply with Federal Aviation Administration (FAA) procedures. Final locations, structures, and structure heights would be submitted to the FAA for the proposed Project. Prior to construction, NWE would file a Notice of Proposed Construction or Alteration form with the FAA (FAA Form 7460-1) if needed. The form would be sent to the manager of the FAA Regional Air Traffic Division Office having jurisdiction over the area where the planned construction would be located. NWE would install high-visibility devices if required by the FAA as a result of their review of that notice.

Fiber optic, communications, control systems and other types of cable may be buried on Burlington Northern Santa Fe Railway property. Prior to construction and prior to subsequent maintenance, reconstruction, repair or removal which requires excavation or earth moving activity on Burlington Northern Santa Fe Railway property, NWE would telephone Burlington Northern Santa Fe Railway's Communication Network Control Center to assist in determining if fiber optic, communications, control systems or other types of cable are buried anywhere on the premises; and if so, NWE would contact the telecommunications company(ies) involved and make arrangements with the same for protection of the fiber optic cable prior to beginning any work on Burlington Northern Santa Fe Railway property.

In addition, if the construction, operation, maintenance, repair, upgrade or removal of the proposed Project would at any time cause interference, including but not limited to physical interference from electromagnetic induction, electrostatic induction, or from stray or other currents, with the operation, maintenance or use by Burlington Northern Santa Fe Railway of its right-of-way, tracks, structures, pole lines, signal or communication lines, radio or other equipment, devices or other property appurtenances thereto, or of any existing lessee or licensee of Burlington Northern Santa Fe Railway, NWE would immediately make such changes in the proposed Project and furnish such protective devices to Burlington Northern Santa Fe Railway and its existing lessees or licensees as would be necessary in the judgment of representatives of Burlington Northern Santa Fe Railway to eliminate such interference. The cost of such protective devices and their installation would be borne by NWE. If any of the interference covered would be, in the judgment of Burlington Northern Santa Fe Railway, of such importance to the safety of Burlington Northern Santa Fe Railway's operations as to require it, NWE, upon notice by Burlington Northern Santa Fe Railway, would immediately take such interim protective measures as Burlington Northern Santa Fe Railway may deem advisable until the protective devices required have been installed, put in operation, tested and found to be satisfactory to correct the interference.

Impact Significance

Based on the foregoing discussion DEQ concludes that no significant transportation impacts would result from this action. There would be no substantial stress to the transportation system in the area

4.3.3 Socioeconomics

Introduction

Potential socioeconomic effects of construction and operation of the proposed Project are examined in this section. Socioeconomic impacts arise mostly from requirements for mobilizing and deploying labor, capital and material resources. Application of these factors of production addresses changes in the levels and patterns of peoples' activities in the area, including employment, housing, commercial activities, and public services and infrastructure (e.g., schools, roads, public safety and public health). Whether these changes are beneficial or adverse largely depends on the degree or magnitude and duration of changes in the baseline levels of utilization and the capacity of the resources to accommodate changes in demand.

The impact assessment starts with a description of the proposed Project's relevant construction and operation resource requirements. These are then compared with the socioeconomic resources within the general Project area. The typical measures of socioeconomic impacts include changes in population, employment, and income, wherein the proposed Project's inputs and outputs for these parameters are superimposed upon the proposed Project area's socioeconomic baseline (which was evaluated in Section 3.3). The difference between expected baseline conditions and conditions with the Project comprise the impacts. Judgments are then made as to the intensity, duration, and reversibility of any impacts, and, the need for measures to avoid or reduce impacts.

Proposed Action: Summary of Characteristics Relevant to Socioeconomic Impacts

Constructing the Project would be a relatively small undertaking in terms of socioeconomic resource requirements and impacts. The Project would take approximately one year to construct, employing up to 40 workers (an average of 25 FTEs [full-time equivalents] is assumed in this analysis). Such an undertaking would entail a payroll of about $3,120,000 (assuming an average wage of $30 per hour; benefits are not included but can be assumed to add about 25 percent to the direct wage bill). Total costs, based on experience for transmission lines of this length and capacity of about $200,000 per mile, would be approximately $12 million including the proposed substation work, plus small land costs for the slightly wider ROW (40 feet) needed.

The bulk of the proposed Project payments for labor and capital goods would "leak" out of the Project area via payments to non-local and out-of-state sources of cable, structural steel, transformers, etc., specialty contractors and their personnel, and equipment suppliers. For this analysis, it is assumed that 60 percent of after-tax workers' wages, and equally, 60 percent of Project capital purchases, would be expended out of the Project area. Thus, approximately $2,184,000 in wages would be re-spent by Project (assuming take-home wages amount to 70 percent of the total). Furthermore, capital purchases made within the Project area are assumed to total approximately $840,000 for purposes of this analysis. Although costs for land for the

slightly wider ROW are unknown, for analysis purposes, the total local non-labor costs are estimated at $1,000,000.

It should be noted that the above estimates are based on assumptions, backed by general experience with projects of this type, which are viewed as reasonable.

Once construction is completed, and operation begins, the Project would employ only a few workers, if any, above the current labor requirements for the existing transmission line. Expenditures on operation and maintenance would be small as to be insignificant and are not addressed in this analysis.

Impact Results

Economic Impacts

Placed in the socioeconomic context of Gallatin and Broadwater Counties--a mostly rural and sparsely populated region of a projected 79,330 population in 2005, with an estimated aggregate personal income of just above $2.0 billion[4]—the infusion of workers' local spending and local construction procurements totaling and estimated $3,184,000 would place unnoticeable burden on the assimilative capacity of the local economy. These expenditures would, however, be beneficial, albeit largely unnoticeable.

Workers' local consumer goods purchases and contractors' procurements of construction supplies would be the principal economic benefits of the construction phase accruing to the local economy. Providers of transient accommodations, eating and drinking places, automotive services, construction materials vendors (e.g., sand and gravel, concrete, lumber, etc.), and equipment leasing establishments in communities near the proposed Project would be the main beneficiaries. The benefits would be short term, however, with the proposed Project schedule running for only about a year.

The impact may be considered as beneficial, but minimal. Multiplier effects result from the local expenditures for Project labor, capital facilities, and supplies. As these moneys are re-spent within the region, the total increment to the original direct Project payments becomes a multiple of those direct payments.

An analysis of these multiplier impacts was undertaken using a widely used and accepted economic assessment model, IMPLAN**.** IMPLAN is an input-output model depicting the interactions within an economy, which for this analysis was calibrated to conditions in the Project area, which is combined Gallatin and Broadwater Counties. New investment expenditures for labor and capital that are spent locally would re-circulate through the economy. However, since most of the wages and purchases would be spent outside the Project area, the multiplier effects on employment and income would be quite small. Results using the IMPLAN model predict that only 15 jobs, above those provided by the Project, would be created in the

[4] Based on projected year 2005 populations for the two counties, multiplied by the year 2001 respective per capita incomes, with a small increase in real per capita incomes assumed. These figures are in year 2001 dollars to match the latest data year for per capita personal incomes.

Project area. Total personal income would increase by only about $360,000, above the direct wage income to Project construction workers.

Impacts on Population

Increases in employment in an area generally lead to increases in population, as some of those who take jobs associated with a project move to the area. As noted, the direct Project construction work force is likely to be drawn from both within and outside the Project area; however, those who relocate are unlikely to bring dependents. Since many jobs induced by the Project by repeated re-spending of Project expenditures would likely be assimilated into the local economy. Some very minimal immigration of persons and dependents is likely to occur even as a result of short-term construction.

Between 1990 and 2001, based on U.S Bureau of Economic Analysis population and employment estimates, the change in population divided by the change in employment was just under 1.0. Year to year changes showed for each increase in employment, a nearly equal change in population occurred. As noted earlier, construction employment would be very transient and would be unlikely to result in a change in population, itself. However, the additional 15 jobs projected in the economy from multiplier effects would be diffuse, and could result in such average population increases. Thus, an increase of about 15 in the population (not including Project construction workers living in temporary quarters) can be expected. Such a small population increase would not be noticeable in light of the total population.

Operational employment may also indirectly cause some of these indirect population increases. However, the level of employment and expenditures for operations would be so minimal that population increases would be extremely minimal (no more than a handful of persons), if they occur at all.

Impacts on Housing

As described in Section 3.3 Socioeconomics (under "Housing"), the supply of rental and for-sale units is somewhat tight. However, workers on short-term construction projects who relocate to the area are most likely to choose transient accommodations such as hotel/motel rooms or RV parks.

Direct socioeconomic impacts could primarily take the form of increases in demand for transient accommodations from non-local workers recruited to work on the proposed Project. This might be regarded as a cost in the sense that they might overload available space or displace customary users of motels and campgrounds near the proposed Project. However, as noted in Section 3.3 Socioeconomics (under "Housing"), there are an estimated 58 lodging establishments and RV facilities within a 25-mile radius of the Project, assuming a "centroid" location of Belgrade, and 85 within a 25-mile radius of Bozeman. This level of transient accommodations suggests that there would be space for up to 25 non-local Project workers within reasonable commuting distance of the Project site. The region's visitor-serving industry is well developed, and the number of people related to the Project would be a minimal impact on the level of demand for accommodations. The additional business for local motels, RV parks, etc., would represent a short-term economic benefit for the area, almost entirely in Gallatin County since few facilities are available in southern Broadwater County.

After completion of construction, transmission line operations and maintenance activities would have essentially no socioeconomic effects on the area. Personnel requirements would be negligible, and would place no extra burden on housing or other infrastructure and services.

Impacts on Public Services

Due to the low level of population change associated with the Project (about 15 people), no significant impacts on public services such as sewer, water, schools, police, or fire are expected. The most direct potential demands would likely be, if they occur, incidents of fire, worker accidents at the site, oil or hazardous materials events, or potentially, construction materials theft and vandalism. Such events are highly unlikely to occur at all.

As discussed in Chapter 3.3, both Gallatin and Broadwater Counties have hazardous waste emergency response teams and procedures in place that would cover the Project site. Similarly, the Proposed route is under the jurisdiction of local fire districts, and the Sheriffs Departments of both counties, as well as for emergency medical services, should such needs arise. Furthermore, as described in Chapter 2.0, procedures would be in place on site to provide best management practices for health and safety, and can be considered effective measures.

Impacts on Fiscal Conditions

The principal indirect effect would be fiscal, arising from property taxes on the proposed Project's real and personal property in Gallatin and Broadwater Counties. Assessing values for the Project is the purview of the state assessor, and has not yet been determined. However, assessed value can be approximated by the expected construction cost of the Project, which would be on the order of $12 million, including proposed substation work. Due to depreciation over the project life, property tax payments would decline gradually of the life of the Project. Property tax payments would be a small but welcome addition to the revenues of Broadwater and Gallatin Counties, and the various local taxing jurisdictions (school, library, fire district, etc.).

Impact Significance

Impacts to population and housing in the Project area are not considered significant based on the foregoing discussion. The project would not displace a large number of existing residences in any location causing the construction of replacement housing elsewhere, displace a substantial number of people from any location causing the construction of replacement housing elsewhere, or induce substantial population growth in the project area either directly or indirectly.

4.3.4 Environmental Justice

Presidential Executive Order 12898 of February 11, 1994, states that all federal actions must address and identify as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations in the United States. Since the proposed Project entails permits from the federal government, and since the issuing federal agencies may utilize this environmental assessment for those permits, it must satisfy the Order. The issue is whether construction and

operation of the proposed 161kV transmission line would cause minority and/or low-income persons to bear a disproportionate share of the environmental effects of the proposed Project.

EPA's guidelines for evaluating Environmental Justice compliance include the statement that a possibility of Environmental Justice problems exists if more than 50 percent of the population in the area of influence of the proposed Project is minority or low-income. Census data for the two counties indicate that minorities comprise less than 5% of the population and that less than 15% of the area population lives below the poverty level. Accordingly, it appears that the proposed Project does not satisfy the criterion for a finding of Environmental Justice non-compliance.

4.3.5 Health and Safety

Safety and Electric and Magnetic Fields

Introduction

Electric induction involves a short-term electrical interaction between the transmission line and objects referred to as "capacitive coupling." In this type of coupling, a voltage is produced onto objects that are near the power line such as trees or houses.

Magnetic induction is a result of the current in the transmission line conductor coupling (this type of coupling occurs through the air) voltages into a parallel conductor (or nearly parallel which generally means that the conductors are at a angle of 45 degrees or less) system (fence, pipeline, etc.). This effect is referred to as "inductive or magnetic coupling." The conductor system must be generally in parallel to the line to cause any significant coupling or induction effects.

The proposed Project would produce electric and magnetic fields (EMF), because of the voltage applied to the transmission line conductors and the current in the lines. The strength of the electric field is expressed in terms of V/m or kilovolts per meter (kV/m) and the strength of the magnetic field is expressed in term of milliGauss (mG). Similar to electric fields, the intensity of magnetic fields decreases as distance from the source increases; however, unlike electric fields, buildings, trees and most other objects do not provide shielding from magnetic fields.

Electrical transmission lines are not the only sources of magnetic fields. Within homes and work places, local sources of magnetic fields include building wiring and plumbing, electric blankets, electric stoves, computer terminals, bedside clocks, ceiling fans and other appliances that people may use for prolonged periods. It is noteworthy that some of the common sources of higher magnetic fields are appliances and electrical devices found within the home. The magnetic field levels from such sources in typical use can range up to thousands of mG or higher; however, the duration of exposure from many appliances is typically much shorter than that from other sources. Thus, exposure to both electric and magnetic fields occurs continuously, and is not simply a function of living or working near a power line or facility. Exposure depends upon the many sources and field strengths that are present where a person lives, works and otherwise spends time.

A computer model was used to determine the electrical and magnetic field strengths, from existing and proposed lines, through Manhattan and along Jackrabbit Lanes, south of Belgrade.

In these areas, the existing 50kV transmission lines were modeled and the following assumptions were made: The line currents used for the magnetic field models are based on the 24-hour time weighted average for the daily maximum line loads recorded since January 2003 in a system normal configuration (no line outages).

Then, the proposed future 161kV/50kV (transmission) and 12.5kV (distribution) circuits were modeled. In modeling future field strengths, the following assumptions were made: The line currents used in the transmission magnetic field models represent the system normal (no line outages) forecasted peak currents for both the 161kV and 50kV circuits. The line current used for the future 12.5kV circuit loading represents an estimated average current on a peak loading day.

The proposed Project would be designed and constructed in accordance with National Electrical Safety Code (NESC) requirements, which provides for minimum allowable distances between the lines and the ground or other objects and from the lines to the edge of the ROW. The line also would be designed and constructed in accordance with FCC regulations, which require NWE to record and investigate any complaints of radio and television interference reported and take corrective action when necessary. These standards are designed to address interference issues, not human health issues, even though complying with the NESC requirements promotes safety, which benefits people. Impacts associated with railroads can be found in Section 4.3.2.

The proposed Project would be constructed at safe distances according to NESC requirements from existing structures and vehicle traffic, so that no electric or magnetic induction impacts are expected. The Project would also include line designs (such as buried counterpoise wires) to eliminate safety or railway equipment concerns for the Montana Rail Link/Burlington Northern Santa Fe Railway according to guidelines from the American Railway, Engineering and Maintenance-of-way Association (AREMA). No uses currently located within the ROW would be changed due to the construction and operation of the proposed Project. Vegetation would be inspected on a regular basis and, if necessary, trimmed or removed to prevent electrical induction between the vegetation and line. This is important because of the possibility that electric induction effects from the power lines could cause vegetation (particularly when it is dry) to ignite and cause a fire.

Impact Results

The presence of electric fields surrounding the transmission line presents the potential for induced current or spark discharge shocks between conductive objects within line's electric field. The potential for adverse effects to humans or livestock would be low due to several factors: Established ground-to-wire clearances limit electric field strength to levels which do not pose a significant hazard or nuisance. Due to electric field induction, NWE would ground fences and metal buildings as required in the ROW, (fences that are parallel to the line outside of the ROW are dealt with on a case-by-case basis) eliminating these objects as sources of induced current and voltage shock. While mobile objects such as vehicles and other machinery cannot be grounded permanently, the NESC requires that sufficient conductor clearance be maintained to limit the induced short-circuit current in the largest anticipated vehicle under the line to 5 milliamperes (mA) or less. This would be accomplished by limiting access or by increasing conductor clearances in areas where large vehicles could be present.

Magnetic fields associated with the transmission lines can also induce voltage and current in long conducting objects that are parallel to the transmission line. When grounded, objects such as irrigation pipes, pipelines, electric distribution lines, railroads or telephone lines, can form a conducting loop (see Safety section on page 32 for discussion of NWE's grounding practices). The situation can become dangerous if only one end of such an object is grounded when an induced voltage appears across the open end of the loop. Electrical shock could occur if a person were to close the circuit by contacting both the ground and the conductor. Magnetic induction effects from the proposed Projectt would be effectively reduced or eliminated through measures to reduce impacts such as appropriate grounding practices and maintenance of ground-to-wire clearances.

The most conservative (resulting in the highest) electric and magnetic field strengths for the proposed Three Rivers to Jackrabbit 161kV transmission line would be based on minimum line clearances to ground (typically at the middle of the span between two transmission structures along the line), and the highest projected future load growth of the transmission line system. There are several transmission structure designs in the transmission line. The maximum loads (based on future load growth) for the 161kV, 50kV, and 12.5kV circuits of the Three Rivers to Jackrabbit 161kV transmission line are 153 amps, 238 amps, and 200 amps respectively. The electric and magnetic field values are calculated along a profile perpendicular to the transmission line. The magnetic field strength plot for the most conservative (produces the higher magnetic field strength values) line design and operating power flow conditions is shown in Figure 4-2. The plot in Figure 4-2 shows that the magnetic field strength at the edge of ROW for a 40-foot ROW (20 feet either side of centerline) would be 10 mG. The magnetic field strength at a distance of 40 feet from the centerline (80-foot ROW) would be 5 mG. The electric field strength plot is shown in Figure 4-3. The electric field plot depicts that the electric field strengths throughout the line are below 1.0 kV/m. Table 4-1 compares existing magnetic field strengths for the existing 12.5kV and 50kV lines with those proposed for the double circuit 161 and 50kV transmission lines with a 12kV under-built line. The magnetic field strengths values for the proposed Three Rivers to Jackrabbit 161kV and 50kV transmission line are the same order of magnitude but slightly lower than the existing 50kV transmission line magnetic field strengths shown in Section 3.3.5.

The magnetic field calculations and graphs below (refer to Table 4-1 and Figures 4-2 and 4-3) are the worst-case scenario and would result from a combination of the proposed 161kV transmission line in a double circuit configuration with the existing 50kV, plus a 12kV line in an under-built position. The magnetic field strengths for multiple electrical circuits on the same structure are not additive of each individual circuit. Some magnetic fields strengths are reduced when occupying an area with other magnetic fields (e.g., double circuit configuration with distribution under-built as proposed).

Based on the design and safety provisions in the applicant's proposal, upgrading the existing transmission line would not substantially alter the existing electrical and magnetic fields along the existing transmission line corridor. Where the proposed transmission line would be located in an area without an existing line (approximately 2.5 miles), the proposed transmission line would have field strengths similar to those found along other area lines.

Table 4-1 Magnetic Field Strengths Along Existing Lines and the Proposed 161kV Transmission Line

ROW Profile	Existing 50kV Line	Existing 12.5kV Line	Proposed 161kV and 50kV Lines, with the 12 kV Under-Build
20 feet from centerline (edge of right-of-way)	11 mG	6 mG	10 mG
40 feet from centerline	5 mG	3 mG	5 mG

Figure 4-2 Three Rivers to Jackrabbit Transmission Line Magnetic Field Strength

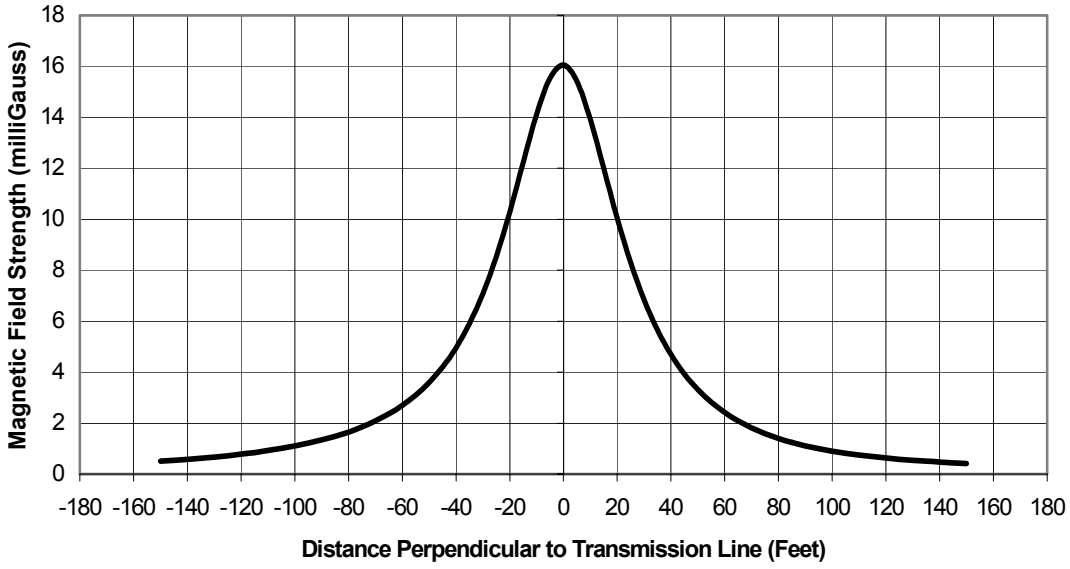
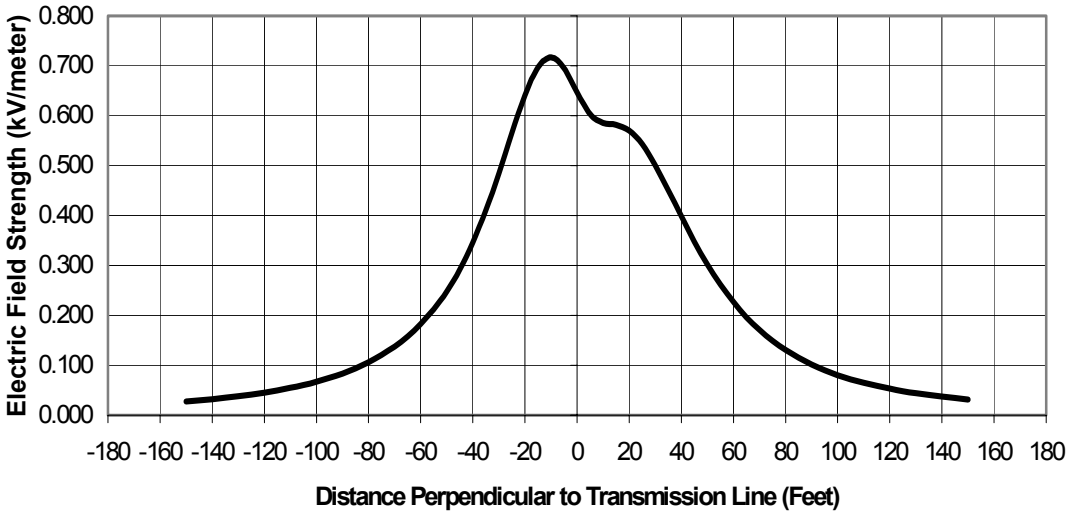


Figure 4-3 Three Rivers to Jackrabbit Transmission Line Electric Field Strength



Possible Health Effects of Electric and Magnetic Fields

This section reviews the results of selected recent reports pertaining to possible links between electric and magnetic fields and health effects. Results are presented in chronological order and demonstrate how scientific knowledge in this area is still unfolding.

A number of studies in the late 1980s and 1990s investigated a possible association between power lines and EMF and the incidence of childhood leukemia. The studies included:

- Four studies which used wire codes to assess exposure to EMF were considered to be of sufficient quality to evaluate an association between the incidence of childhood leukemia and exposure to magnetic fields (Wertheimer & Leeper, 1979, Savitz *et al.*, 1988,London *et al.*, 1991, and Linet *et al.*, 1997). (The wire code method includes a number of factors, such as the wiring in the home, and the distance of home from the power line.)
- Four studies were considered to be of sufficient quality by the National Institute of Environmental Health Sciences (NIEHS) to be used in an evaluation of the association between the incidence of childhood brain tumors and classification of exposure based on wire codes (Savitz *et al.*, 1988; Wertheimer & Leeper, 1979, Gurney *et al.*, 1996; and Preston-Martin *et al.*, 1996b).
- Three studies of appliance use evaluated the association between the incidence of childhood leukemia and exposure to magnetic fields (Hatch *et al.*, 1998; London *et al.*, 1991; Savitz *et al.*, 1990).

In 1996, a National Research Council committee of the National Academy of Sciences (NAS) released its evaluation of research on potential associations between EMF exposure and cancer, reproduction, development, learning, and behavior. The report concluded:

> "Based on a comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects."

The NAS focused primarily on the association of childhood leukemia with the proximity of the child's home to power lines. The NAS panel found that although a link between EMF exposure and increased risk for childhood leukemia was observed in studies that had estimated EMF exposure using the wire code method; this link was not found in studies that had included actual measurements of magnetic fields at the time of the study.

In 1992, the U.S. Congress authorized the Electric and Magnetic Fields Research and Public Information Dissemination Program (EMF-RAPID Program) in the Energy Policy Act (PL 102-486, Section 2118). The Congress instructed the National Institute of Environmental Health Sciences (NIEHS), National Institutes of Health and the Department of Energy to direct and

manage a program of research and analysis aimed at providing scientific evidence to clarify the potential for health risks from exposure to extremely low frequency (ELF) EMF.

Seven years later, the 1999 NIEHS report stated the following in its conclusion section:

> "The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak. The strongest evidence for health effects comes from associations observed in human populations with two forms of cancer: childhood leukemia and chronic lymphocytic leukemia in occupationally exposed adults. While the support from individual studies is weak, the epidemiological studies demonstrate, for some methods of measuring exposure, a fairly consistent pattern of a small, increased risk with increasing exposure that is somewhat weaker for chronic lymphocytic leukemia than for childhood leukemia. In contrast, the mechanistic studies and the animal toxicology literature fail to demonstrate any consistent pattern across studies although sporadic findings of biological effects (including increased cancers in animals) have been reported. No indication of increased leukemias in experimental animals has been observed.
>
> The lack of connection between the human data and the experimental data (animal and mechanistic) severely complicates the interpretation of these results. The human data are in the "right" species, are tied to "real-life" exposures and show some consistency that is difficult to ignore. This assessment is tempered by the observation that given the weak magnitude of these increased risks, some other factor or common source of error could explain these findings. However, no consistent explanation other than exposure to ELF-EMF has been identified.
>
> Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF-EMF at environmental levels and changes in biological function or disease status. The lack of consistent, positive findings in animal or mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but it cannot completely discount the epidemiological findings.
>
> The NIEHS concludes that ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures."

More recently, childhood leukemia has been associated with exposure to magnetic fields in the highest exposure groups, in recent reviews and pooled studies (International Agency for Research on Cancer (IARC) 2001, Ahlbom et al 2000, and Greenland et al 2000). The basis for these relationships remains unexplained (Brain et al 2003). Kavet and Zaffanella (2002) suggested that contact currents could explain the association between high residential magnetic fields and childhood leukemia. Contact currents flow through the body whenever a person touches two conductive surfaces that are at different voltages. Leukemia in childhood is rare. In

the US, about 2-3 cases per 100,000 person years for children 0-20 years old have been reported, but the rate peaks at two to three times this rate in 0-4-year olds (Brain et al 2003).

In the first of the analyses of pooled data, Ahlbom et al (2000) reported that if nine studies that included long-term measurements of magnetic fields were pooled, a statistically significant association could be found for childhood leukemia in the children with average exposures of 4 mG (0.4 microTesla) or greater. For children with lower average exposures, no significant elevation of childhood leukemia was found in the pooled studies. As indicated by Figure 4.2 magnetic field strength exceeds 4 mG from the center of the proposed transmission line to a point on either side of the line roughly 45 feet from the center of the transmission line. In the second of the analyses of pooled data, Greenland et al (2000) reported that if the 15 studies for which magnetic fields were measured (or could be estimated) were pooled, a statistically significant association (relative risk = 1.7) could be found for childhood leukemia in the children with average exposures of 3 mG (0.3 microTesla [the United States measures magnet fields in Milligauss {mG}, the rest of the world measures magnetic fields in Tesla {μT}])) or greater. For children with lower average exposures, no significant elevation of childhood leukemia was found in the pooled studies. According to the authors, this data indicates that exposure to power-frequency magnetic fields could account for 0-8% of childhood leukemia deaths in the United States (Moulder undated). As indicated by Figure 4.2 magnetic field strength exceeds 3 mG from the center of the proposed transmission line to a point on either side of the transmission line roughly 50 feet from the center of the transmission line. Along the proposed line approximately 21 residential parcels are located within the 3 mG zone and only one house is located near the proposed transmission line, and is 35 feet away.

The World Health Organization's International Agency for Research on Cancer (IARC) met in June 2001 to review the scientific evidence regarding the potential carcinogenicity of static and ELF-EMF. An international scientific panel was created consisting of 21 experts from 10 countries. The panel categorized its conclusions for carcinogenicity based on the IARC classification system that evaluates the strength of evidence from epidemiological, laboratory (human and cellular), and mechanistic studies (Classifications are "carcinogenic to humans," "probably carcinogenic to humans," and "possibly carcinogenic to humans."). The IARC concluded that,

> "ELF magnetic fields are possibly carcinogenic to humans, based on consistent statistical associations of high level residential magnetic fields with a doubling of risk of childhood leukemia and power-frequency (50 or 60 Hz) residential ELF magnetic field strengths above 0.4 microTesla. In contrast, no consistent evidence was found that childhood exposures to ELF electric or magnetic fields are associated with brain tumors or any other kinds of solid tumors. No consistent evidence was found that residential or occupational exposures of adults to ELF magnetic fields increase risk for any kind of cancer."

Short and Long Term Health Effects

Pacemakers

Sources such as welding equipment, power lines at electric generating plants, and rail transportation equipment can produce lower frequency EMF strong enough to interfere with some models of pacemakers and defibrillators. The exposure guidelines developed by the

American Conference of Governmental Industrial Hygienists (ACGIH), state that workers with cardiac pacemakers should not be exposed to a 60-Hz magnetic field greater than 1 gauss (1,000 mG) or a 60-Hz electric field greater than 1 kilovolt per meter (1,000 V/m).

The electric and magnetic fields from the 161kV transmission line are below the levels established in the guidelines.

Breast Cancer

The interest by researchers that the possibility that EMF exposure might cause breast cancer was in part because breast cancer is such a common disease in adult women. The early studies identified a few electrical workers with male breast cancer, which is a very rare disease. A link between EMF exposure and alterations in the hormone melatonin was considered a possible hypothesis for breast cancer. This idea provided motivation to conduct research addressing a possible link between EMF exposure and breast cancer. Overall, the published epidemiological studies have not shown such an association with EMF exposure expected from the proposed Three Rivers-Jackrabbit transmission line and breast cancer.

Miscarriage

According to a recent article in EPRI Journal online, "the question of whether exposure to power-frequency electric and magnetic fields (EMF) might be linked to the risk of miscarriage and other adverse reproductive health outcomes has been the subject of scientific investigation for more than two decades. In 2002, the question took on new importance when the results of two large epidemiologic studies were published. The studies, conducted by research teams led by Dr. Geraldine Lee at the California Department of Health Services (CDHS) and Dr. De-Kun Li a the Kaiser Foundation Research Institute, found an increased risk of miscarriage among California women who were exposed to high peak magnetic fields (maximum exposure above 16 milligauss during the measurement day) in early pregnancy." Maximum magnetic field strength from the proposed line would be less than 16 mG.

Conclusion

The association between measured fields and childhood leukemia is weak, and it is not clear whether it represents a cause-and-effect relationship. At present, the available series of studies indicates no association between EMF exposure and childhood cancers other than leukemia. Far fewer of these studies have been conducted than studies of childhood leukemia.

There have been more than 30 detailed reports on both long-term and short-term studies of EMF exposures in laboratory animals (bioassays) conducted by researchers. Long-term animal bioassays constitute an important group of studies in EMF research. Such studies have a proven record for predicting the carcinogenicity of chemicals, physical agents, and other suspected cancer-causing agents. Researchers compared groups of animals treated with cancer initiators to groups treated with cancer initiators and then exposed to EMF, to see if EMF exposure promoted the cancer growth (initiation-promotion model). Other studies tested the cancer promotion potential of EMF using mice that were predisposed to cancer because they had defects in the genes that control cancer.

Most of the studies conducted for animals (primarily rodents such as rats) suggest a lack of carcinogenicity, and the few with borderline positive results are inadequate to conclude that

exposure to magnetic fields at the magnitude and field configurations at which they were investigated increases the incidence of cancer in rodents.

The proposed transmission line would have field strengths similar to or slightly lower than the existing 50kV transmission line. Along the proposed transmission line approximately 21 residential parcels are located within the 3 mG zone and only one house is located near the proposed transmission line, and it is 35 feet away.

No-Action Alternative

Under the No Action Alternative, the proposed Project would not be built. Therefore, there would be no change to existing conditions.

Impact Significance

Impacts would not be considered significant for the Project because objects in the ROW (e.g., parallel fences) would be properly grounded to eliminate electric shocks, trees close to the transmission line would be cleared reducing the possibility of fires, agriculture equipment would not be too close to the transmission line causing a line outage and possible unsafe conditions for operators of the equipment, and magnetic field strengths would not be substantially higher than those associated with existing transmission lines in the area.

4.4 CULTURAL ENVIRONMENT

4.4.1 Cultural Resources

Introduction

Cultural resource studies for the Project included a Class I inventory of public lands that are under the administration of the MDNRC. These lands are located in the T2N, Range 2E, Section 8 and in T1S, R4E, Section 11 (Study Areas). The Class I inventory results are reported in Chapter 3. This Chapter describes the potential impacts to cultural resources.

Impact Results

A search of the Montana CRABS and CRIS files by the Montana SHPO, reported that a single cultural property was previously identified in the study corridor. Property, 24GA0212, the "*Three Forks of the Missouri National Historic Landmark*" is reported within one of the designated search locales-T2N, R2E Section 8. Review of the record form for property 24GA0212, on file with the University of Montana Archaeological Records Office however, reveals that the location of this property is recorded as follows (emphasis added).

"T2N, R2E, Section 9, S½ of Section 8, Sec, 17, N½ SEC 20, W½, NW¼ SEC 21"

The lands under study in the Class I Inventory are located in the NE ¼ of Township 2N, Range 2E, Section 8, and thus, are outside the described boundary of property 24GA0212. The

proposed line, as located on public lands under the administration of the DNRC, would have no effects to property 24GA0212. Existing electric transmission lines are present in the study corridor, adjacent to and within the boundaries of property 24GA0212. Therefore, the construction of the proposed line would not add any element out of character with the current setting of property 24GA0212.

The archaeologist for the Montana DNRC was consulted regarding any record that agency had of either known cultural properties or previous cultural resource inventories in the study corridor. The MDNRC archaeologist reported that no inventories for cultural resources are recorded for either of the locales included in the study corridor, and that such inventories would be required in advance of the issuance of any rights-of-way for the proposed transmission lines over the lands under the administration of the MDNRC.

NWE would sponsor on-site cultural resource inventories of the ROW located in T2N, Range 2E, Section 8 and in T1S, R4E, Section 11, consisting of public lands under the administration of the MDNRC, in advance of any transmission line construction. Such inventory would be done as part of the MDNRC consideration of applications to the MDNRC for rights-of-way for the proposed transmission line. The inventory would meet the standards for such studies as defined by the MDNRC. Any cultural properties identified in the inventory would be evaluated for potential eligibility for listing in the National Register of Historic Places (NRHP), in a consensus process among NWE, the MDNRC and the Montana SHPO.

Evaluations of the potential for effects to cultural properties found eligible for NRHP listing would be made in a consensus process among NWE, the MDNRC and the Montana SHPO. That evaluation would consider the effects of various activities associated with line construction, as well as routine operations and maintenance of the line after construction. If potential effects are identified in that process, then measures would be developed to avoid or lessen the potential effects and those measures would be implemented as part of the planning for and construction of the proposed transmission line and in the future routine operation and maintenance of the line.

No-Action Alternative

Under the No Action Alternative, the proposed Project would not be built. No impacts would occur to cultural resources within the study corridor. However, the existing 50kV transmission lines would still be in place and maintenance would continue. As well, the rebuild of the Trident-Belgrade 50kV transmission line would also occur.

Impact Significance

Impacts to cultural resources would not be significant because the project would not create a substantial adverse change to a property on, or eligible for, the National Register of Historic Places. Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings, such that the significance of an historical resource would be materially impaired.

4.5 CUMULATIVE IMPACTS

Because of the age and deteriorating condition of the existing 50kV transmission line between Trident and Belgrade, NWE plans to reconstruct this line regardless of the need for the proposed 161kV transmission line. Since the impacts from the 50kV rebuild will occur in the near future, combining the two projects would minimize cumulative effects of constructing the projects separately. Placing both circuits on one double circuit 161/50kV pole and doing the construction at one time would reduce the "spreading" of impacts over a larger geographic area for two separate and parallel lines. Combining both lines onto a single structure design for 23 miles would reduce impacts to businesses, resources and landowners. Cumulative impacts for the following resources are described below.

4.5.1 Wildlife/Biological Resources

Cumulative impacts on biological resources are generally additive and proportional to the amount of ground disturbance within specific habitat areas. The construction of transmission lines and other linear features may potentially impact wildlife and botanical species. In general, constructing transmission lines can result in minimal long-term effects to both botanical and wildlife species. Unlike concentrated developments, such as mines, shopping malls, residential development or parking lots, transmission lines are often constructed with little land clearing and grading.

Long-term cumulative impacts to plants and animals can be attributed to habitat fragmentation caused by land clearing and ground disturbance. The botanical and wildlife habitat in Montana is being increasingly fragmented by new development causing populations to be separated from critical food and water sources and other populations of the same species.

Habitat fragmentation brought about by various kinds of development (roads, housing developments, etc.) results in an increasing number of isolated plant and wildlife populations. Four major consequences for wildlife result from this fragmentation:

- loss of wilderness species- those that are area sensitive and depend on large patches of habitat for the maintenance of viable populations
- loss of larger species that normally occur in low densities and move over wide areas
- fragmented, human-influenced landscapes become invaded or dominated by alien or already common species adapted to interaction with human activity
- inbreeding depression results as a consequence of low densities and isolated populations

The Proposed Action would contribute to minimal cumulative impacts related to habitat fragmentation by utilizing an existing utility corridor and spanning sensitive habitats such as riparian woodlands.

Management practices and measures to reduce impacts proposed in this EA would work to reduce or eliminate the Proposed Action contributing to cumulative impacts to biological resources.

4.5.2 Water Resources and Wetlands

The Proposed Action in combination with other past, present and future projects would not contribute to a long-term change in stream flows or water use; therefore, it would not contribute to cumulative effects of water quantity. Agricultural operations, grazing or residential use of water would be the main contributors to water quantity changes in the project area.

No future utility projects have been identified in the project area. Given that the general project area is the fastest growing part of Montana, it is reasonable to assume that private development projects will occur in the project area in the future. Drainage studies and grading plans would evaluate both the onsite and offsite effects for other projects in the area. These would have to be reviewed and approved by the appropriate entities before the projects could legally proceed. Adherence to standard and site-specific permit conditions for construction of other development projects would minimize individual or collective impacts to surface water quality.

The Proposed Action would contribute to minimal cumulative impacts on water quality within the project area as a result of land disturbing activities and use of access roads in areas adjacent to surface water features. These activities would combine with recreational use of roads and surface water and livestock grazing to cumulatively impact water quality during the construction phase of the Proposed Action and until substantial revegetation of the project area has occurred. Impacts include increased sediment load in streams and loss of riparian vegetation.

The ground disturbing activities proposed in this EA would have minimal cumulative impacts on aquatic ecosystems and their respective species because of the relatively small amount of disturbance foreseen, and because of the protective standards and guidelines and stipulations which would be implemented and monitored. Considering the total amount of past, present and reasonably foreseeable disturbance for the area and effects on aquatic ecosystems, the cumulative impacts would be minor.

4.5.3 Visual Resources

Project-specific visual impacts from transmission line projects generally consist of long-term impacts from the introduction of larger transmission structures and conductors into existing utility rights of ways. The construction aspects of the project, however, will be a temporary change to the landscape. The Proposed Action is located both within or adjacent to existing right-of-ways or utility corridors, a typical practice for transmission lines. However, these manmade elements would cumulatively impact the visual resources of the area by introducing stronger visual contrast to the existing landscape.

The cumulative impact would depend on the level of visual contrast between the existing surroundings and the Proposed Action. The Proposed Action, in conjunction with the other projects discussed herein involving the addition of constructed facilities and land clearings into the landscape, could cause cumulative impacts to residential viewers, highway viewers and to some recreation viewpoints in the vicinity of the Project.

4.5.4 Land Use

In general, cumulatively, the impacts represent a relatively small increment of change. Only a small amount of land would be removed from uses other than transmission lines. The greatest change would be one of scale (the corridor would have two transmission lines with poles) and the perception of land use compatibility. Because the incremental change would be small, compatibility issues would likely be minor. Likewise, short-term proximity impacts associated with construction (noise, dust and traffic interference) would result in minor cumulative impacts.

Numerous transmission lines exist in the study corridor. Upgrading of transmission lines would not change its character, nor would it change land uses significantly.

Losses of agricultural land from the Proposed Action would be small compared to the total agricultural acreage in the area. In 2002 Broadwater County had 68,120 acres of harvested (irrigated and non-irrigated) crops while Gallatin County had 153,410 acres of harvested crops (irrigated and non-irrigated). The amount of land temporarily taken out of production, and the amount of cultivated agricultural land not being used would be negligible compared to the total amount of agricultural lands in production. Poles and conductors would incrementally increase hazards for aerial spraying.

In and around the City of Belgrade area, land uses are changing rapidly. As development increases, demands for parks, roads, schools and other amenities may increase. Development in urban and some rural areas within Gallatin County are primarily driven by the availability of utilities and the type of land uses allowed. Belgrade is planning to extend services south of Interstate 90 and the DEQ's Water Protection Bureau is currently evaluating a groundwater pollution control system application for proposed wastewater facilities in the Jackrabbit Substation area. This wastewater facility would service three planned new subdivisions (residential and commercial) as well as other existing developments in the area. These planned actions would tend to increase or stimulate development. Increased development activity and human presence over time would contribute to cumulative impacts such as associated traffic congestion, potential land use compatibility conflicts, and other impacts of proximity to transmission lines.

4.5.5 Cultural Resources

No cumulative impacts were identified in consideration of cultural resources within the Project area. Cultural resource inventory of the Project area is not likely to identify any such impacts in the future.

4.6 EIS DETERMINATION

Based on the analysis of potential environmental impacts contained in this EA, impacts associated with the Proposed Action as assessed by DEQ and the other Cooperating State Agencies will not be significant, and an EIS is not required.

CHAPTER 5

CONSULTATION AND COORDINATION

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CONSULTATION AND COORDINATION

In response to the Montana Environmental Policy Act (MEPA), a scoping process was developed for the Project to ensure that members of the public, federal, state, and local agencies were contacted, consulted, and given an adequate opportunity to be involved in the process. This chapter describes the DEQ scoping process, and other formal and/or informal reviews or consultations.

5.1 COORDINATION WITH DEQ

DEQ staff met with NWE and Power Engineers, Inc. on several occasions to discuss the proposed Project. Phone conversations and email communication between DEQ, NWE, and Power Engineers also occurred. Topics discussed during this communication included EA outline, public involvement, purpose and need for the Project, potential impacts, MEPA components, alternative routes, and mitigation.

DEQ also conducted a public scoping meeting on October 23, 2003 at the Belgrade Middle School. Notice of the public meeting was published in the Bozeman Daily Chronicle on October 12 and 19, 2003. The public notice for the meeting is included as Appendix B. Scoping comments from this public meeting are summarized in Chapter 1 and have been addressed within this EA.

5.2 PUBLIC NOTICES

Several public notices were published in local newspapers to announce NWE intention of the proposed Project. These notices occurred in April and May of 2003 and were published in the following newspapers:

- Three Forks Herald (April 30, 2003)
- High County Independent Press (May 1, 2003)
- The Manhattan Churchill Times (May 6, 2003)
- Bozeman Daily Chronicle (May 6, 2003)

The public notice is included as Appendix C.

5.3 AGENCIES CONSULTED

Agencies and organizations having jurisdiction and/or specific interest within the proposed Project Area were contacted to inform them of the proposed Project, to verify the status and availability of existing environmental data, to solicit their input during the EA process, and to notify them of the scoping meeting. The following is a list of agencies that were formally contacted.

- U.S. Department of the Interior Fish and Wildlife Service
- US Army Corps of Engineers
- Montana Department of Fish Wildlife and Parks
- Montana Department of Natural Resources and Conservation
- Montana Department of Environmental Quality
- Gallatin Conservation District
- Montana Department of Transportation
- Montana State Historic Preservation Office
- Montana Department of Commerce

An interagency meeting was held to discuss the Project with representatives from the above listed agencies. The meeting was held on June 24, 2003 at the Metcalf Building in Helena.

5.4 PUBLIC REVIEW OF THE EA

The public will have chance for review and comment regarding this EA. DEQ will distribute copies of the EA to individuals and groups that have expressed interest and/or were present at the public scoping meeting. DEQ will then solicit comments on the EA during this 15-day comment period.

CHAPTER 6

75-1-201 (1)(B)(IV)(D) REGULATORY ANALYSIS

CHAPTER 6
75-1-201 (1)(B)(IV)(D) REGULATORY ANALYSIS

State agencies are regulating the use of private property under various statutes adopted pursuant to the police powers of the state. However, no additional measures are proposed at this time to restrict the use of NWE's private property and therefore no further analysis of these restrictions is required.

CHAPTER 7

REFERENCES

CHAPTER 7
REFERENCES

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CHAPTER 8

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PREPARERS AND REVIEWERS

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APPENDIX A

Impact Tables

Appendix A

Introduction

The potential environmental consequences, or impacts, described in this Appendix are based on the environmental effects that would result from the construction, operation and maintenance of the Proposed Action. A detailed discussion of the specifications and construction of the Proposed Action can be found in Chapter 2.

Impact Assessment

To identify project-related impacts, changes to the environment that would result from construction, operation and maintenance of the Proposed Action were compared to the existing environment as described in Chapter 3.

The types of impacts that could occur were defined, and impact locations were identified for each resource. Impacts can be direct or indirect, short-term or long-term.

The impact locations were recorded by milepost along the Proposed Route and depicted on resource maps. This information is summarized in the Chapter 4 resource sections with data tables provided in this Appendix.

To quantify ground-disturbing impacts from the Proposed Action along the Proposed Route, the topography and existing land use were identified and categorized as part of the initial project design phase. Areas identified as having flat or gently sloping terrain and existing access roads were assumed to have fewer miles of ground disturbance than steep areas with few existing roads.

Ground disturbance levels are described below:

Level 1

Agricultural land - Access to the transmission line would be achieved by overland travel across agricultural lands. No permanent roads would be built.

Level 2

Existing improved road - Existing roadways are located adjacent to and would be available for access to the right-of-way. Only short spur roads off the existing roadways would be needed to access the structures.

Level 3

Existing transmission line right-of-way - The new transmission line would be parallel to an existing transmission line. Access would be from existing maintenance roads needing some improvements. New spur roads would be needed to access new structure locations.

Level 4

No road - No existing roads are available for access to the transmission line. Permanent access roads would be built along the right-of-way for construction and maintenance of the transmission line.

Tables identifying ground-disturbing impacts for biological, land use, and water and wetland resources by milepost are included in this Appendix.

Measures

Where significant or potentially significant impacts were initially identified, an evaluation was conducted to determine if one or more measures to reduce impacts would be effective in avoiding or reducing (e.g., intensity and/or duration) the potential impact to a level of insignificance. These measures were adopted by NWE as part of the Proposed Action and are described in Chapter 2 and consist of measures or techniques NWE would employ to avoid or minimize potential impacts. Impacts remaining after applying any or all measures are described in the Appendix.

Appendix A

Impacts to Biological Resources

MILEPOST FROM	MILEPOST TO	LENGTH	FEATURE	GROUND DISTURBANCE LEVEL	MEASURE(S) TO REDUCE IMPACTS	IMPACT
0.0	5.4	5.4		1, 2		NI
6.4	8.5	2.1	small dropseed	2	3, 4, 5	L
9.0	12.8	3.8		2	4, 5	NI
12.8	13.1	0.3	Low quality rip. Forest / migratory birds (Gallatin River and associated peripheral wetlands)	2	1, 2, 3, 4, 5	L
13.1	16.4	3.3		2	4, 5	NI
16.4	20.2	3.8		2, 3	4, 5	NI
20.2	20.4	0.2	Migratory Birds (Gallatin River)	3	1, 2, 3, 4, 5	L
20.4	25.2	4.8		3	4, 5	NI
25.2	26.9	1.7		2, 3	4, 5	NI
26.9	27.0	0.1	Migratory Birds (Missouri River)	2, 3	1, 2, 3, 4, 5	L
27.0	28.6	1.6		3	4, 5	NI

Measures to Reduce Impacts

1. Conductor would be strung within the same general location and horizontal plane of existing conductor over river crossings to minimize impacts of bird collisions.
2. Bird diverters would be installed on conductors and/or overhead ground wires at river crossings and as indicated in Figure 4-1.

3. To minimize amount of sensitive features disturbed in designated areas, poles would be placed so as to avoid sensitive features such as, but not limited to, riparian areas, eagle perch trees, and watercourses and/or to allow conductors to clearly span the features, within limits of standard pole design. If the sensitive features cannot be completely avoided, poles would be placed so as to minimize the disturbance.

4. Prior to construction, all supervisory construction personnel would be instructed on the protection of ecological resources. To assist in this effort, the construction contract would address: (a) Federal, state, and local laws regarding plants and wildlife; (b) the importance of these resources and the purpose of protecting them; and (c) methods for protecting sensitive resources.

5. Prior to construction, NWE would develop a noxious weed control plan in consultation with the DEQ, DNRC, and the weed control board to minimize the effects of noxious weeds due to proposed Project activities. The plan would address any required cleaning of construction vehicles to minimize spread of weeds.

Appendix A

Impacts to Water Resources

MILEPOST FROM	MILEPOST TO	LENGTH	FEATURE	GROUND DISTURBANCE LEVEL	MEASURE(S) TO REDUCE IMPACTS	IMPACT
0.0	0.1	0.1	Subsurface Irrigation Culvert	1	-	L
0.1	0.6	0.5	No water features or wetlands	-	-	NI
0.6	0.7	0.1	Irrigation Ditch	1	1	L
0.7	1.8	1.1	No water features or wetlands	-	-	NI
1.8	2.0	0.2	Irrigation Ditch	1	1	L
2.0	3.0	1.0	No water features or wetlands	-	-	NI
3.0	3.7	0.7	Irrigation Ditch	2	1	L
3.7	3.9	0.2	No water features or wetlands	-	-	NI
3.9	5.4	1.5	Irrigation Ditch	2	1	L
5.4	5.9	0.5	Irrigation Ditch	2	1	L
5.9	7.5	1.6	No water features or wetlands	-	-	NI
7.5	7.6	0.1	Irrigation Ditch	2	1	L
7.6	8.7	1.1	No water features or wetlands	-	-	NI
8.7	8.8	0.1	Irrigation Ditch	2	1	L
8.8	9.0	0.2	No water features or wetlands	-	-	-
9.0	9.6	0.6	No water features or wetlands	-	-	-
9.6	9.7	0.1	Irrigation Ditch	2	1	L
9.7	10.8	1.1	No water features or wetlands	-	-	NI
10.8	10.9	0.1	Irrigation Ditch	2	1	L
10.9	12.8	1.9	No water features or wetlands			
12.8	13.0	0.2	Gallatin River associated peripheral wetlands	2	1, 2, 3, 4	L
13.0	13.1	0.1	Gallatin River, perennial stream crossing, borrow pit wetlands	2	1, 2, 3, 4	M
13.1	13.2	0.1	Borrow pit wetlands	2	1, use upland for access, 2, 3, 4	L
13.2	14.5	1.3	No water features or wetlands	-	-	NI
14.5	14.6	0.1	Baker Creek and associated peripheral wetlands, perennial stream crossing	2	1, 2, 3, 4	L
14.6	14.7	0.1	No water features or wetlands	-	-	NI
14.7	14.8	0.1	Camp Creek and associated peripheral wetlands, perennial stream crossing	2	1, 2, 3, 4	L
14.8	19.6	4.8	No water features or wetlands	-	-	NI
19.6	19.7	0.1	Irrigation Ditch, intermittent	3	1	L
19.7	20.0	0.3	No water features or wetlands	-	-	NI
20.0	20.1	0.1	Irrigation Ditch	3	1	L
20.1	20.3	0.2	No water features or wetlands	-	-	NI
20.3	20.4	0.1	Gallatin River, perennial stream crossing	3	1, 2, 3, 4	L
20.4	25.2	4.8	NWI data unavailable, all features can be spanned	3	1	L
25.2	26.9	1.7	No water features or wetlands	-	-	NI
26.9	27.0	0.1	Missouri, perennial	3	1, 2, 3, 4	L
27.0	28.5	1.5	No water features or wetlands	-	-	NI

Measures to Reduce Impacts

1. To minimize amount of sensitive features disturbed in designated areas, poles would be placed to avoid sensitive features such as, but not limited to, riparian areas, eagle perch trees, and watercourses and/or to allow conductors to clearly span the features, within limits of standard pole design. If the sensitive features cannot be completely avoided, poles would be placed to minimize the disturbance.

2. Erosion and sediment control measures would meet requirements for the Clean Water Act.

3. Roads would be built at right angles to the streams and washes to the extent practicable. Culverts would be installed where needed. All construction and maintenance activities would be conducted in a manner that would minimize disturbance to drainage channels, and streambanks (e.g., poles).

Appendix A

4. To minimize ammount of sensitive features disturbed in designated areas, poles would be placed to avoid sensitive features such as, but not limited to, riparian areas, eagle perch trees, and water courses and / or to allow conductors to clearly span the features, within limits of standard pole design. If the sensitive features cannot be completely avoided, poles would placed to minimize the disturbance.

Appendix A

Impacts to Visual Resources

MILEPOST FROM	TO	LENGTH	FEATURE / VISUAL CONTRAST	MEASURE(S) TO REDUCE IMPACTS	IMPACT
0.0	5.4	5.4	Weak visual contrast where route parallels 50kV and 161kV transmission lines. Foreground and middle ground views from dispersed rural residences. Foreground views from MT Route 85.	2	L
5.4	6.4	1.0	Weak visual contrast where route parallels 50kV transmission lines. Foreground views from suburban residences and MT Route 85.	1	L
6.4	9.0	2.6	Strong to moderate visual contrast where route doesn't parallel existing transmission lines. Middle ground with intermittent foreground views from suburban residences. Foreground views from I-90.	1	M
9.0	12.8	3.8	Weak visual contrast where route parallels 50kV transmission lines. Foreground views from suburban residences and I-90.	1	L
12.8	13.3	0.5	Strong to moderate visual contrast from the removal of overstory riparian vegetation. Foreground views from dispersed recreationists along the Gallatin River and motorists travelling I-90.	1, 2	M
13.3	16.4	3.1	Weak visual contrast where route parallels 50kV transmission lines. Foreground views from I-90.	2	L
16.4	17.2	0.8	Weak visual contrast where route parallels 50kV transmission lines. Foreground views from Manhattan town residences.	1	L
17.2	25.2	8.0	Weak visual contrast where route parallels 50kV transmission lines. Second Gallatin River crossing requires no vegetation clearing. Middle ground and background views from dispersed rural residential viewpoionts.	2	L

Appendix A

Impacts to Visual Resources

25.2	26.3	1.1	Weak visual contrast where route parallels 50 and 100kV transmission lines and substations. Not visible from sensitive viewpoints.		L
26.3	26.8	0.5	Weak visual contrast where route parallels 50 and 100kV transmission lines and substations. Foreground views from motorists travelling Route S- 286 and dispersed recreationists associated with the Missouri River.	1, 2	L
26.8	28.5	1.7	Weak visual contrast where route parallels 100kV transmission lines and substations. Not visible from sensitive viewpoints.		L

Measures to Reduce Impacts

1. To reduce visual contrast and reduce siltation in construction areas (e.g., marshalling yards, structure sites, spur roads from existing access roads) where ground disturbance is substantial, surface preparation and reseeding would occur. The method of restoration could normally consist of loosening the soil surface, reseeding, installing cross drains for erosion control, placing water bars in the road, and filling ditches.

2. To minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape, the alignment of any new access roads or cross-country route would follow the landform contours in designated areas where practicable, providing that such alignment does not impact other resource values additionally.

Viewer Impact Matrix

	Visual Contrast Level								
	S			M			W		
	Distance Zone			Distance Zone			Distance Zone		
Visual Sensitivity	FG	MG	BG	FG	MG	BG	FG	MG	BG
H	H	M	L	M	L	L	L	L	L
M	M	M	L	L	L	L	L	L	L
L	L	L	L	L	L	L	L	L	L

Distance Zones: FG=Foreground MG=Middle Ground BG=Background

Visual Contrast Level: S=Strong M=Moderate W=Weak

Viewer Impacts: H=High M=Moderate L=Low

Viewer Impacts

	Visual Contrast Level								
	S			M			W		
	Distance Zone			Distance Zone			Distance Zone		
Visual Sensitivity	FG	MG	BG	FG	MG	BG	FG	MG	BG
H	H	M	L	M	L	L	L	L	L
M	M	M	L	L	L	L	L	L	L
L	L	L	L	L	L	L	L	L	L

Distance Zones: FG=Foreground MG=Middle Ground BG=Background

Visual Contrast Level: S=Strong M=Moderate W=Weak

Viewer Impacts: H = High M = Moderate L = Low

Appendix A

Impacts to Land Use

MILEPOST FROM	MILEPOST TO	LENGTH	FEATURE	GROUND DISTURBANCE LEVEL	MEASURE(S) TO REDUCE IMPACTS	IMPACT
0.0	0.3	0.3	Minor Subdivision 190, Planned Commerce Park Subdivision (within existing 161kV and 50kV transmission line ROW)	2	1, 2, 4, 5, 6, 7	L
0.3	0.4	0.1	Minor Subdivision 190, Garden Center Subdivision (within existing 161kV and 50kV transmission line ROW)	2	1, 2, 4, 5, 6, 7	L
0.4	0.5	0.1	Garden Center Subdivision (within existing 161kV and 50kV transmission line ROW)	2	1, 2, 4, 5, 6, 7	L
0.5	0.6	0.1	Garden Center Subdivision, registered commercial apiary site (within existing 161kV and 50kV transmission line ROW)	2	1, 2, 4, 5, 6, 7	L
0.6	0.7	0.1	Minor Subdivision 190, Garden Center Subdivision, registered commercial apiary site (within existing 161kV and 50kV transmission line ROW)	2	1, 2, 4, 5, 6, 7	L
0.7	1.0	0.3	Minor Subdivision 190, Planned Northstar Subdivision, registered commercial apiary site (within existing 161kV and 50kV transmission line ROW)	2	1, 2, 4, 5, 6, 7	L
1.0	1.1	0.1	Minor Subdivision 190, Planned Northstar Subdivision (within existing 161kV and 50kV transmission line ROW)	2	1, 2, 4, 5, 6, 7	L
1.1	1.2	0.1	No Land Use Features	-	-	NI
1.2	1.6	0.4	Rangeland/Improved Pasture (within existing 161kV and 50kV transmission line ROW)	1	2, 4, 5, 7	L
1.6	1.7	0.1	Irrigated Farmland (within existing 50kV transmission line ROW)	1	2, 4, 5, 7	L
1.7	1.8	0.1	Rangeland/Improved Pasture (within existing 50kV transmission line ROW)	1	2, 4, 5, 7	L
1.8	2.1	0.3	Irrigated Farmland (within existing 50kV transmission line ROW)	1	2, 4, 5, 7	L
2.1	2.3	0.2	Rangeland/Improved Pasture (within existing 50kV transmission line ROW)	1	2, 4, 5, 7	L
2.3	3.3	1.0	No Land Use Features	-	-	NI
3.3	3.8	0.5	registered commercial apiary site (within existing 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
3.8	4.3	0.5	No Land Use Features	-	-	NI
4.3	4.8	0.5	registered commercial apiary site (within existing 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
4.8	6.3	1.5	No Land Use Features	-	-	NI
6.3	6.4	0.1	Lexley Acres Mobile Home Park	2	1, 2, 4, 5, 6, 7	M
6.4	6.6	0.2	No Land Use Features	-	-	NI

Appendix A

Impacts to Land Use

MILEPOST FROM	MILEPOST TO	LENGTH	FEATURE	GROUND DISTURBANCE LEVEL	MEASURE(S) TO REDUCE IMPACTS	IMPACT
6.6	6.7	0.1	Minor Subdivision 233	2	1, 2, 4, 5, 6, 7	M
6.7	7.1	0.4	Minor Subdivision 233A	2	1, 2, 4, 5, 6, 7	M
7.1	7.3	0.2	Montana State Trust Land, Farmland of Statewide Importance (Irrigated Farmland)	2	1, 2, 4, 5, 6, 7	M
7.3	7.7	0.4	No Land Use Features	-	-	NI
7.7	8.2	0.5	Rocky Mountain Business Park	2	1, 2, 4, 5, 6, 7	M
8.2	8.4	0.2	Minor Subdivision 63	2	1, 2, 4, 5, 6, 7	M
8.4	8.6	0.2	No Land Use Features	-	-	NI
8.6	8.8	0.2	Minor Subdivision 203	2	1, 2, 4, 5, 6, 7	M
8.8	8.9	0.1	planned commercial subdivision (Lot 7), Interstate 90	2	1, 2, 4, 5, 6, 7	M
8.9	10.2	1.3	No Land Use Features	-	-	NI
10.2	10.4	0.2	Farmland of Statewide Importance (within existing railroad, 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
10.4	10.5	0.1	No Land Use Features	-	-	NI
10.5	10.7	0.2	Farmland of Statewide Importance, registered commercial apiary site (within existing railroad, 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
10.7	10.9	0.2	registered commercial apiary site (within existing railroad, 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
10.9	11.0	0.1	Prime Farmland if irrigated, registered commercial apiary site (within existing railroad, 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
11.0	11.3	0.3	Prime Farmland if irrigated (within existing railroad, 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
11.3	15.0	3.7	No Land Use Features	-	-	NI
15.0	15.5	0.5	Prime Farmland if irrigated (within existing railroad, 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
15.5	15.6	0.1	Prime Farmland if irrigated, Montana Rail Link (within existing railroad, 50kV	2	1, 2, 4, 5, 6, 7	L
15.6	16.3	0.7	Prime Farmland if irrigated (within existing railroad, 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
16.3	17.9	1.6	Prime Farmland if irrigated (within existing railroad, 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
17.9	18.0	0.1	No Land Use Features	-	-	NI
18.0	18.2	0.2	Prime Farmland if irrigated (within existing railroad, 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
18.2	18.3	0.1	No Land Use Features	-	-	NI
18.3	19.3	1.0	Prime Farmland if irrigated (within existing railroad, 50kV transmission line ROW)	2	2, 4, 5, 6, 7	L
19.3	19.5	0.2	Prime Farmland if irrigated (within existing railroad, 50kV transmission line ROW)	3	2, 3, 4, 5 6, 7	L

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Impacts to Land Use

MILEPOST FROM	MILEPOST TO	LENGTH	FEATURE	GROUND DISTURBANCE LEVEL	MEASURE(S) TO REDUCE IMPACTS	IMPACT
19.5	20.0	0.5	Conservation Easement (Montana Land Reliance), Prime Farmland if irrigated (within existing railroad, 50kV transmission line ROW)	3	1, 2, 3, 4, 5, 6, 7	L
20.0	20.5	0.5	No Land Use Features	-	-	NI
20.5	20.8	0.3	Prime Farmland if irrigated (within existing 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
20.8	21.3	0.5	No Land Use Features	-	-	NI
21.3	21.5	0.2	Farmland of Statewide Importance (within existing railroad, 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
21.5	21.7	0.2	No Land Use Features	-	-	NI
21.7	21.9	0.2	Prime Farmland if irrigated (within existing 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
21.9	22.5	0.6	No Land Use Features	-	-	NI
22.5	22.7	0.2	Prime Farmland if irrigated (within existing 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
22.7	22.8	0.1	No Land Use Features	-	-	NI
22.8	22.9	0.1	Farmland of Statewide Importance (within existing railroad, 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
22.9	23.3	0.4	Prime Farmland if irrigated (within existing 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
23.3	23.9	0.6	No Land Use Features	-	-	NI
23.9	24.3	0.4	Farmland of Statewide Importance (within existing railroad, 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
24.3	24.7	0.4	No Land Use Features	-	-	NI
24.7	24.8	0.1	Farmland of Statewide Importance (within existing railroad, 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
24.8	25.1	0.3	Prime Farmland if irrigated (within existing 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
25.1	25.2	0.1	Two transmission lines (Anaconda-Billings 230kV and 161kV), Prime Farmland if irrigated (within existing 50kV transmission line ROW)	3	1, 2, 3, 4, 5, 6, 7	L
25.2	25.6	0.4	Prime Farmland if irrigated (within existing 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L

Appendix A

Impacts to Land Use

MILEPOST FROM	MILEPOST TO	LENGTH	FEATURE	GROUND DISTURBANCE LEVEL	MEASURE(S) TO REDUCE IMPACTS	IMPACT
25.6	25.9	0.3	Farmland of Statewide Importance (within existing 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
25.9	26.0	0.1	Prime Farmland if irrigated (within existing 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
26.0	26.1	0.1	Rangeland/Improved Pasture, Farmland of Statewide Importance (within existing 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
26.1	26.2	0.1	Farmland of Statewide Importance (within existing 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
26.2	26.7	0.5	No Land Use Features	-	-	NI
26.7	26.8	0.1	Route S-286, Montana Rail Link (within existing 50kV transmission line ROW)	3	1, 2, 3, 4, 5, 6, 7	L
26.8	26.9	0.1	No Land Use Features	-	-	NI
26.9	27.0	0.1	Missouri River	-	1, 7	L
27.0	27.4	0.4	No Land Use Features	-	-	NI
27.4	27.9	0.5	Montana State Trust Land, Rangeland/Improved Pasture (within existing 50kV transmission line ROW)	3	2, 3, 4, 5, 6, 7	L
27.9	28.5	0.6	No Land Use Features	-	-	NI

Measures to Reduce Impacts

1. To minimize amount of sensitive features disturbed in designated areas, poles would be placed so as to avoid sensitive features such as, but not limited to, riparian areas, eagle perch trees, and watercourses and/or to allow conductors to clearly span the features, within limits of standard pole design. If the sensitive features cannot be completely avoided, poles would be placed so as to minimize the disturbance.

2. To the extent feasible, Project facilities, including poles and access roads would be installed along the edges or borders of private property and recreation areas. NWE would consult with the landowner or land management agency to identify facility locations that create the least potential for impact to property and its uses.

3 . To limit new or improved accessibility into the area by off-highway vehicles (OHVs) and other motorized vehicles, all new access undesired or not required for maintenance would be closed using the most effective and least environmentally damaging methods appropriate to that area with concurrence of the landowner or land manager.

4. Existing improvements would be repaired or replaced if they are damaged or destroyed by construction activities to their condition prior to disturbance as agreed to by the parties involved.

5. Fences and gates would be installed, or repaired and replaced to their original condition prior to proposed Project disturbance as required by the landowner or the land management agency if they are damaged or destroyed by construction activities. Temporary gates would be installed only with the permission of the landowner or the land management agency and would be restored to original condition prior to proposed Project disturbance following construction. Gates would be closed and locked, depending upon the agreement with the agency and private landowners.

6. All existing roads would be left in a condition equal to or better than their condition prior to the construction of the transmission line.

7. All waste products and food garbage from construction sites would be deposited in a covered waste receptacle, or removed daily. Garbage would be hauled to a suitable disposal facility.

APPENDIX B

Public Scoping Meeting Notice

LEGAL NOTICE

The Montana Department of Environmental Quality (DEQ) will conduct a public meeting on a proposed 161 kV transmission line.

HELENA—The DEQ will conduct a public meeting to identify public concerns and issues relating to NorthWestern Corporation's (NorthWestern) proposed 161 kV electric transmission line between Three Rivers Substation north of Three Forks, MT and Jackrabbit Substation near Four Corners, west of Bozeman, MT. On October 23, 2003, a pubic meeting will be held at 7:00 PM in the Belgrade Middle School cafeteria, 410 Triple Crown Road, Belgrade, MT to gather concerns and issues about the project. Substantial concerns and issues will be addressed in an environmental assessment being prepared by DEQ.

NorthWestern is proposing to upgrade an existing transmission line, which will include reconstructing an existing 50 kV and adding a new 161 kV line to the reconstructed line. The line is approximately 30 miles long, and will connect the existing Three Rivers Substation, three miles northeast of Three Forks, to the existing Jackrabbit Substation near Fours Corners, west of Bozeman. The purpose of the project is to provide reliable electrical service to the Bozeman and Belgrade area and to serve growing loads in these areas. NorthWestern proposes to use the existing 50 kV transmission line corridor, with the possibility of a few local changes.

NorthWestern proposes to install new equipment and expand the Three Rivers and Jackrabbit Substations. Additionally, the company proposes to build a new substation between I-90 and West Hulbert Road that will be used to serve customers in this high growth area.

The new line will consist of a combination of single-pole, wooden structures placed approximately 300 feet apart. These structures would be substantially taller than the existing structures. In some areas two-pole wooden "H-frame" structures may be used to allow longer spacing between structures.

DEQ will make reasonable accommodations for persons with disabilities who wish to participate in the public meeting. A person in need of accommodation should contact Tom Ring at DEQ at (406) 444-6785 to advise of the needed accommodation no later than October 17, 2003.

A brief description of the Three Rivers-Jackrabbit Project and maps showing the proposed route are available on-line at the following address:

http://www.deq.state.mt.us/pcd/emb/fs/fs.htm

Oral scoping comments will be accepted at the public meeting. Written comments will be accepted until November 23, 2003 and may be submitted via post or e-mail to the following addresses:

Montana Department of Environmental Quality
Environmental Management Bureau
Three Rivers- Jackrabbit Project
PO Box 200901
Helena, MT 59620-0901

E-mail to: ThreeRivers_Jackrabbit_ Comments@state.mt.us

October 6, 2003

APPENDIX C

First Public Notice

PUBLIC NOTICE

NorthWestern Corporation (NOR) is proposing to construct a new 161 kV transmission line approximately 30 miles in length. The new line will connect the existing Three Rivers Substation approximately three miles northeast of Three Forks to the existing Jack Rabbit Substation located near Four Corners west of Bozeman.

The Gallatin Valley is one of the fastest growing areas within NorthWestern's service territory and prompts the need for additional electric infrastructure. An electrical transmission system is designed to meet customers' electrical demands throughout the year including certain line outage conditions. During heavy energy loads in the Bozeman area, an outage of existing transmission line or lines that serve the Bozeman area could result in low voltage or thermal overloading of electrical equipment or, under the most critical conditions, cause a wide-scale outage that can effect thousands of customers. The new transmission line will include three pieces that will ensure the area has the infrastructure to accommodate future growth and improve reliability for existing customers. The company proposes to install new equipment and expand the Three Rivers and Jack Rabbit Substations and build a new 161 kV transmission line between the two substations. Additionally, the company proposes to establish a new substation between I-90 and West Hulbert Road that will be used to serve customers in this high growth area.

The general location of the new line is shown on the attached drawing. The line will commence at NorthWestern's Three Rivers Substation which is located in the SW 1/4 of Section 8, T2N, R2E, Broadwater County, Montana. From this point it will continue southeasterly to Manhattan following existing transmission lines. From Manhattan east to Belgrade for the most part the line will follow NorthWestern's existing 50 kV transmission line, railroad right-of-way and Highway 205 to the proposed I-90 crossing located near Belgrade. A new substation is also proposed south of Belgrade. The proposed route then continues south along Thorpe Road and Jackrabbit Lane to NorthWestern's Jackrabbit Substation near Four Corners, the substation is located in NE 1/4 of Section 14, T2S, R4E, Gallatin County, Montana.

The new line will consist of a combination of single-pole, wooden structures placed approximately 300 feet apart. In some areas two-pole wooden "H-frame" structures may be used to allow further spacing between structures.

The standard right-of-way width for a single pole 161 kV transmission line is 50 feet. The standard right-of-way width for two pole "H-frame" structure is 80 feet. The height of the new structures will vary from 60 feet above ground to 90 feet, depending on terrain and structure type.

NOR plans to build the new line under a statutory exclusion from the Montana Major Facility Siting Act. Under Section 75-20-104(8)(a)(ii), MCA, the line would be excluded from Siting Act coverage if NOR obtains right-of-way agreements or options for a

right-of-way from more than 75 percent of the landowners who collectively own more than 75 percent of the property along which the new line is to be located.

If NOR is unable to obtain the statutory exclusion, the Siting Act's full public and agency review provisions will apply to the new line. The Montana Department of Environmental Quality (DEQ), which administers the Siting Act, will then determine the line location.

Questions or concerns you have about your rights under the Siting Act may be directed to Mr. Tom Ring, Facility Siting Section, The Montana Department of Environmental Quality, 1520 East Sixth Avenue, Helena, Montana 59620, tring@state.mt.us or telephone (406) 444-6785.

Any questions you have about the project may be directed to Mr. Rick Walsh, Manager Environmental Permitting, NorthWestern Energy, 40 East Broadway, Butte, Montana 59701, rick.walsh@northwestern.com or telephone (406) 497-3917.

APPENDIX D

Maps

Manhattan Inset

Missouri River Inset

Central Park Inset

Belgrade Inset

Legend

- Study Corridor
- Proposed Route
- Interstate
- Highway
- Major Road
- Minor Road
- # Mile Line
- Railroad
- Old Railroad Grade
- 230kV Transmission Line
- 161kV Transmission Line
- 100kV Transmission Line
- 50kV Transmission Line
- County Boundary
- Township Line
- Section Line
- Municipal Boundary
- River or Stream
- River or Pond
- Airport
- Substation
- Potential Utes Ladies Tresses' Habitat
- Annual Indian Paintbrush
- Bird Rookery
- Dwarf Purple Monkeyflower
- Mealy Primrose
- Slender Wedgegrass
- Small Dropseed
- Agricultural Lands - Dry
- Agricultural Lands - Irrigated
- Grassland
- Shrubland
- Deciduous Forest
- Coniferous Forest
- Forested Riparian
- Shrub Riparian
- Mixed Riparian

THREE RIVERS TO JACKRABBIT
161kV TRANSMISSION LINE

Biological Resources

ENVIRONMENTAL ASSESSMENT MAP 1

0 0.5 1 2 3 4
Miles

1 Inch equals 2 Miles

POWER ENGINEERS

NorthWestern Energy

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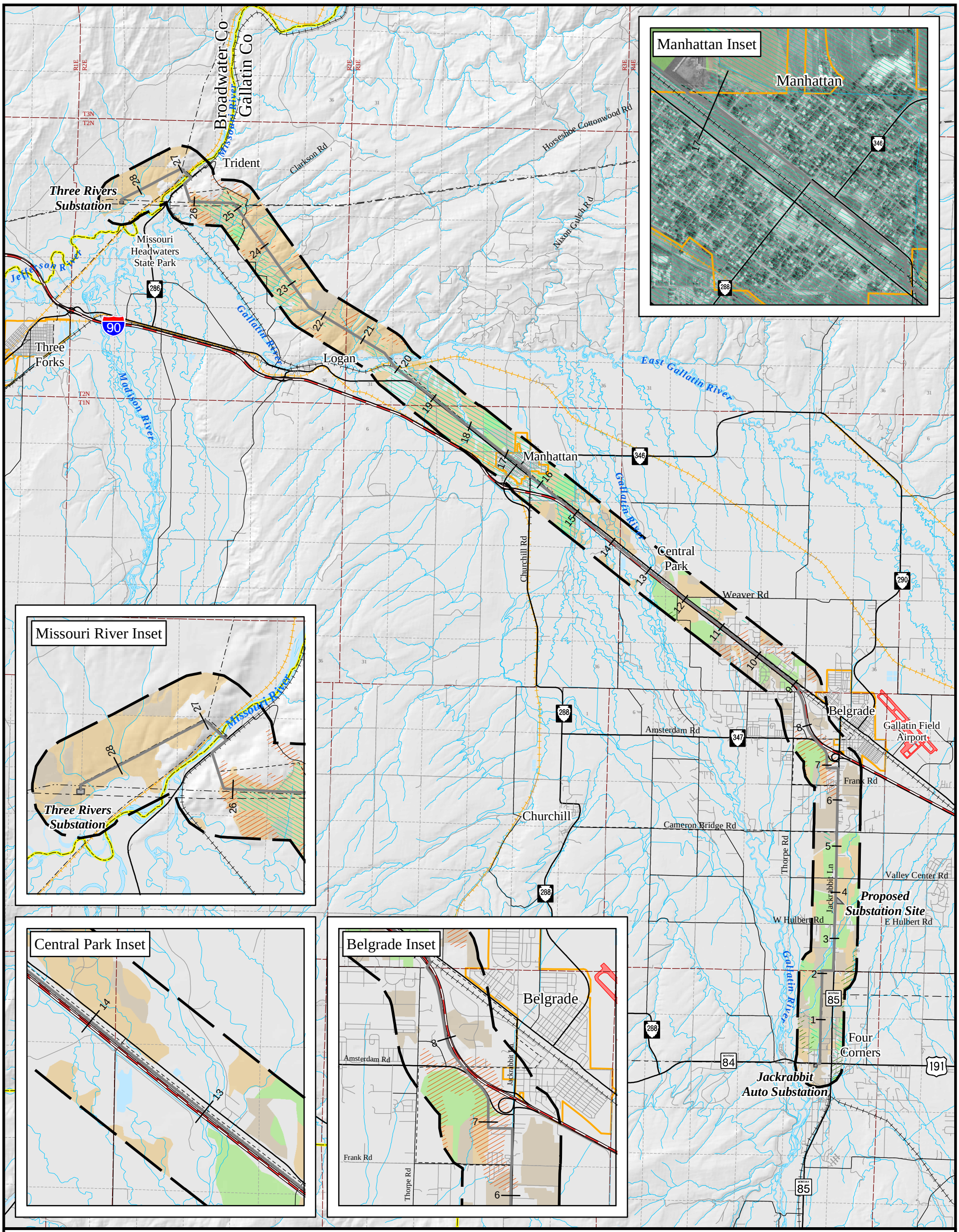
10418007_TRJEABio_Rev6_060404_TDH



Legend

- Study Corridor
- Proposed Route
- # Mile Line
- Interstate
- Highway
- Major Road
- Minor Road
- Railroad
- Old Railroad Grade
- 230kV Transmission Line
- 161kV Transmission Line
- 100kV Transmission Line
- 50kV Transmission Line
- County Boundary
- Township Line
- Section Line
- Municipal Boundary
- River or Stream
- River or Pond
- Airport
- Substation
- Prime Farmland
- Prime Farmland, If Irrigated
- Farmland of Statewide Importance
- Irrigated Farmland
- Non-Irrigated Farmland
- Rangeland/ Improved Pasture

THREE RIVERS TO JACKRABBIT
161kV TRANSMISSION LINE

Agricultural Uses

ENVIRONMENTAL ASSESSMENT MAP 4

0 0.5 1 2 3 4

Miles

1 Inch equals 2 Miles

POWER ENGINEERS

NorthWestern Energy

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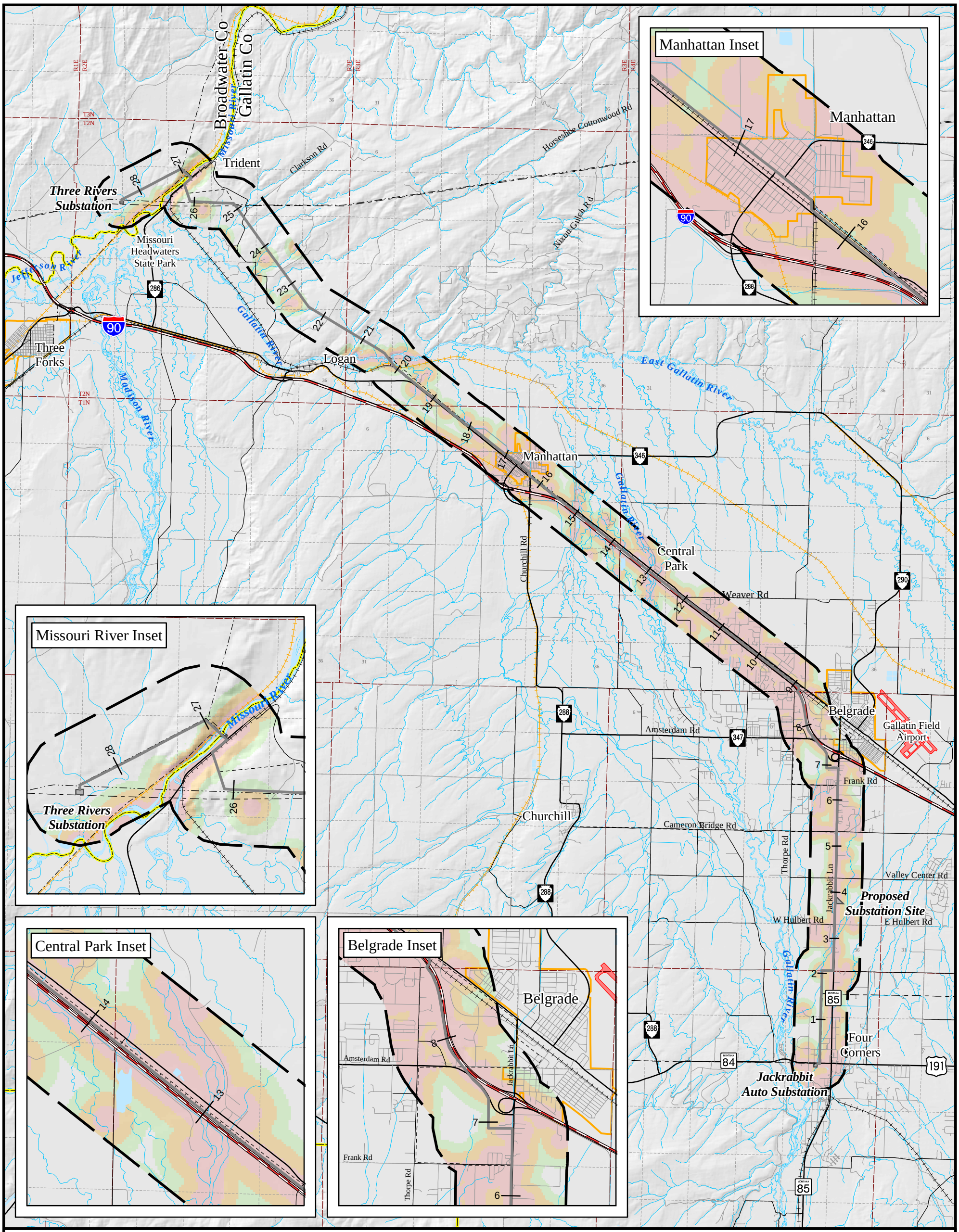

Legend

- Study Corridor
- Proposed Route
- Interstate
- Highway
- Major Road
- Minor Road
- # Mile Line
- Railroad
- Old Railroad Grade
- 230kV Transmission Line
- 161kV Transmission Line
- 100kV Transmission Line
- 50kV Transmission Line
- County Boundary
- Township Line
- Section Line
- Municipal Boundary
- River or Stream
- River or Pond
- Airport
- Substation
- Foreground Visibility (0-500 Feet)
- Middleground Visibility (500-1000 Feet)
- Background Visibility (1000-1500 Feet)

THREE RIVERS TO JACKRABBIT
161kV TRANSMISSION LINE

Visual Resources

ENVIRONMENTAL ASSESSMENT MAP 3

0 0.5 1 2 3 4
Miles

1 Inch equals 2 Miles

N W E S

POWER ENGINEERS

NorthWestern Energy

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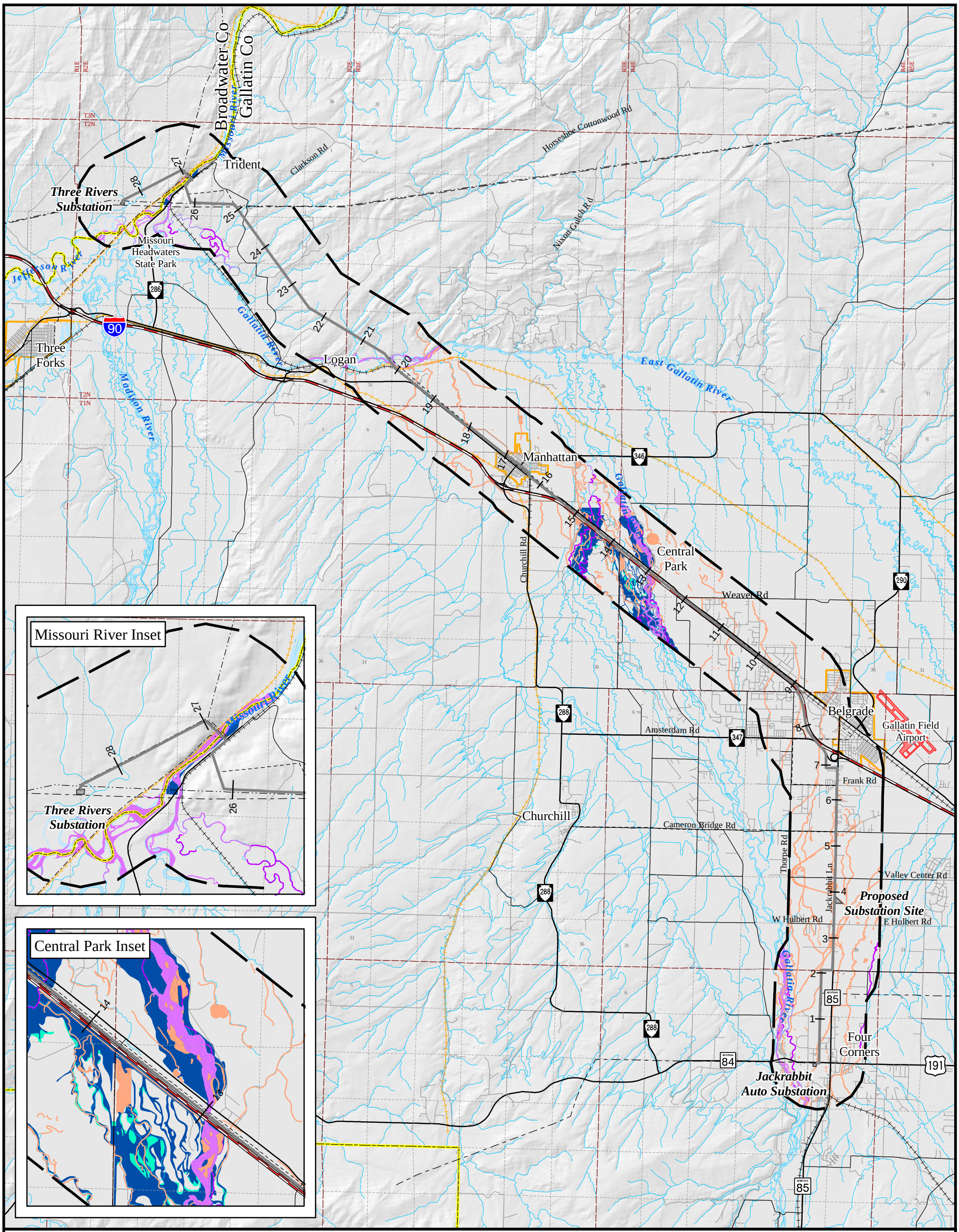

Legend

- Study Corridor
- Proposed Route
- # Mile Line
- Interstate
- Highway
- Major Road
- Minor Road
- Railroad
- Old Railroad Grade
- 230kV Transmission Line
- 161kV Transmission Line
- 100kV Transmission Line
- 50kV Transmission Line
- County Boundary
- Township Line
- Section Line
- Municipal Boundary
- River or Stream
- River or Pond
- Airport
- Substation
- Intermittent Wetland
- Perennial Wetland
- 100 Year Floodplain
- 500 Year Floodplain

THREE RIVERS TO JACKRABBIT
161kV TRANSMISSION LINE

Water and Wetland Resources

ENVIRONMENTAL ASSESSMENT MAP 2

0 0.5 1 2 3 4
Miles

1 Inch equals 2 Miles

POWER ENGINEERS

NorthWestern Energy

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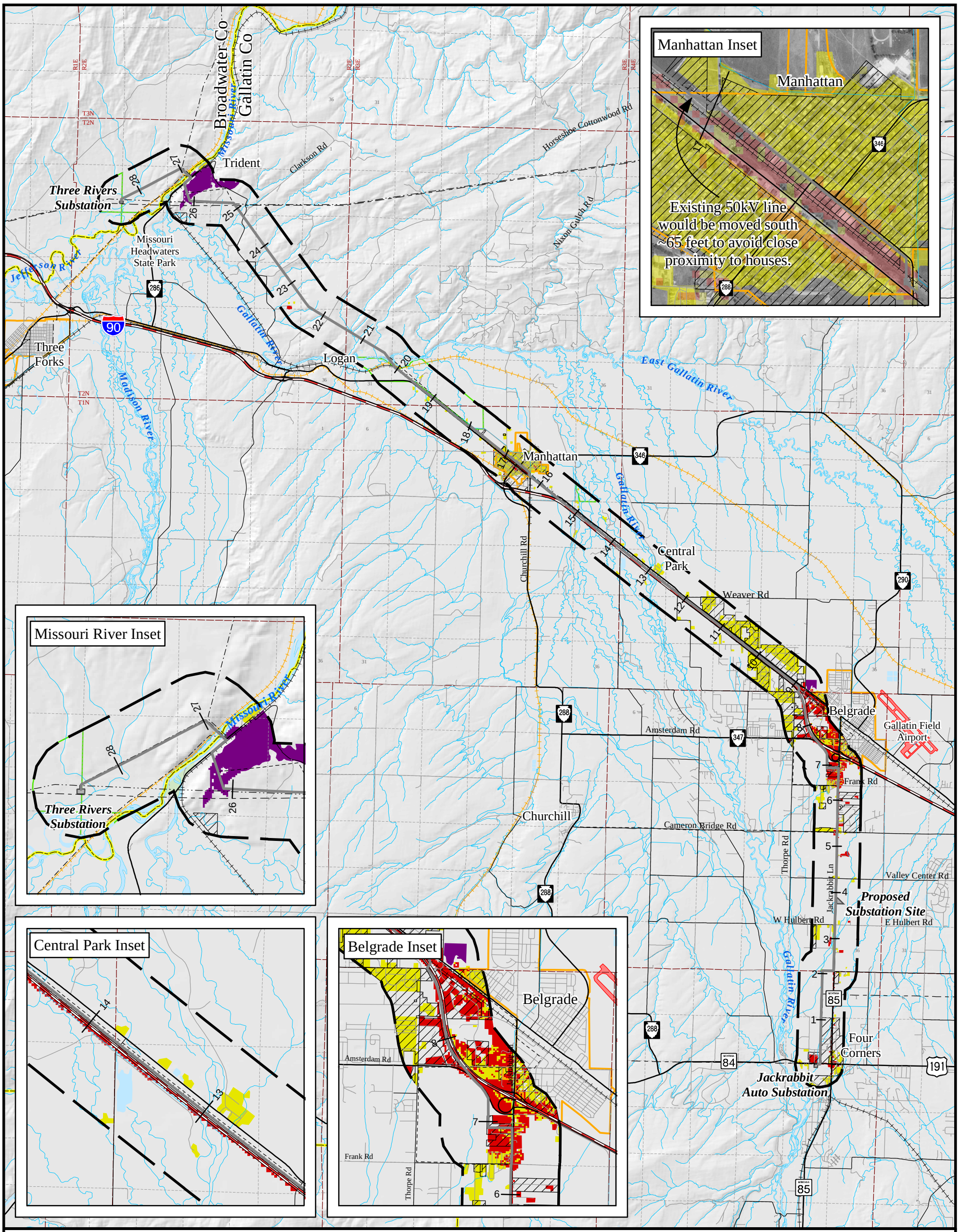
10418007_TRJEAWater_Rev8_061104_TDH


Manhattan Inset
Manhattan
Existing 50kV line would be moved south ~65 feet to avoid close proximity to houses.
Missouri River Inset
Three Rivers Substation
Central Park Inset
Belgrade Inset
Belgrade
Broadwater Co
Gallatin Co
Missouri River
Trident
Clarkson Rd
Horseshoe Cottonwood Rd
Nixon Gulch Rd
Missouri Headwaters State Park
Jefferson River
Gallatin River
Three Forks
Madison River
Logan
East Gallatin River
Churchill Rd
Central Park
Weaver Rd
Churchill
Amsterdam Rd
Gallatin Field Airport
Frank Rd
Cameron Bridge Rd
Thorpe Rd
Jackrabbit Ln
Valley Center Rd
Proposed Substation Site
E Hulbert Rd
W Hulbert Rd
Four Corners
Jackrabbit Auto Substation
Legend
Study Corridor
Proposed Route
Interstate
Highway
Major Road
Minor Road
Mile Line
Railroad
Old Railroad Grade
230kV Transmission Line
161kV Transmission Line
100kV Transmission Line
50kV Transmission Line
County Boundary
Township Line
Section Line
Municipal Boundary
River or Stream
River or Pond
Airport
Substation
State Park
Conservation Easement
Subdivision
Residential
Commercial/Industrial
Quarries/Mines
THREE RIVERS TO JACKRABBIT
161kV TRANSMISSION LINE
Land Use
ENVIRONMENTAL ASSESSMENT MAP 5
0 0.5 1 2 3 4
Miles
1 Inch equals 2 Miles
N
W
E
S
POWER ENGINEERS
NorthWestern Energy
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